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CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY

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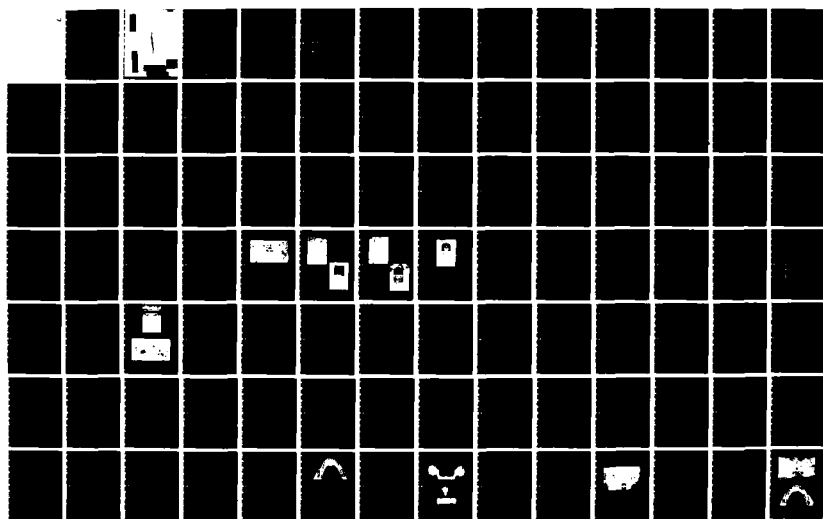
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CEDAR GROVE HISTORIC CEMETERY:

A STUDY IN BIO-HISTORY

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DEDICATION

This report is dedicated to the people
living and dead of Cedar Grove whose
story this is.

ABSTRACT

Excavations carried out in 1982 (by the Arkansas Archeological Survey under contract with the New Orleans District of the U.S. Army Corps of Engineers) at the Cedar Grove site (3LA97) in Lafayette County, Arkansas, recovered and relocated 80 graves from an historic Black cemetery threatened by revetment construction along the south bank of the Red River. Each grave was excavated and the artifactual and skeletal data were recorded in temporary field laboratories prior to the relocation of all remains to a new cemetery. Analysis of the artifactual material dated all graves to the period 1890 to 1927 when the cemetery was covered by silt from a major flood of the Red River. Preliminary analysis of the casket hardware and personal grave goods suggests differential mortuary treatment by age and possibly economic resources. Analysis of the skeletal demographics showed that the reconstructed age and sex profile represents a highly stressed but normal biological population. Preliminary analysis of the skeletal data indicates high frequencies of anemia, rickets, scurvy, and protein malnutrition. The presence of weanling diarrhea is indicated by high frequencies of systemic periostitis, active cribra orbitalia, and a modal childhood age at death of 18 months. High frequencies of degenerative joint disease on the adult skeletons suggests a hard rigorous life style which indicates that the amount of physical labor required of Blacks had not changed since slavery. Comparison of these data to the historical record reveals that diet, health, and general quality of life for southwest Arkansas Blacks had deteriorated significantly since emancipation due to the fall in cotton prices and legalized discrimination.

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Finally and most importantly our thanks and appreciation must go to the members of the Cedar Grove Baptist Church and all members of the Cedar Grove community without whose help and understanding this project would not have been possible.

Chapter 1

INTRODUCTION

by W. Fredrick Limp and Jerome C. Rose

A few years ago James Deetz (1977), in his book In Small Things Forgotten, stated that archeology could be used to study even the recent past. He further argued that history was often blind, or at least biased, commonly ignoring those who had little political or economic power. This is certainly not a fair characterization of history, but it is true that there remain significant gaps in our knowledge of many areas and people who did not, for one reason or another, reach the threshold of historic visibility. One such historically invisible group is the Blacks of the rural south particularly between emancipation and the Depression (Farley 1970:3; Fogel and Engerman 1974:260; Sutch 1975:389). Historic archeologists have recently suggested that a combination of historical, archeological, and ethnographic approaches could contribute to the closing of these gaps in our knowledge (Schuyler 1972:22). In fact Deetz (1977) predicted that Afro-American archeology would soon become an important part of the historical inquiry.

We hope that this report and the preliminary analysis which it contains sheds light on Black history in rural southwest Arkansas. This report could not rely only upon the written records of these people, as documents are so few in number. Rather it is based on the material records of their existence which in this case is the evidence of life, death, disease, and hope which are "written" in the most final of all documents, the grave. Through the material remains of death and the participation of the living in that event, we hope to better understand the lives of the people who were buried in the cemetery of the Cedar Grove Baptist Church.

It is essential to emphasize the specific contributions which archeology and osteology can make toward improving our understanding of Black American history. Fairbanks (1972:62) provides a suitable answer when he points out that the vast majority of the extensive literature on American slavery has been written by the ruling class and these documents

"are generally lacking in specific information about the daily circumstances of the slaves." Even when the slaves themselves left documents (e.g., Hughes 1897; Northup 1968) the mundane details of daily life are frequently ignored in preference to more important issues. It is true that we have extensive descriptions of slave activities, slave clothing, slave diets, and slave health in the plantation day books, wills, letters, and other documents, but do they tell the whole story or just those events significant to the plantation owner? Many debates both small and large can be found in the historical literature concerning such topics as the size of slave cabins, the possession of weapons, the extent of slave hunting, and the acquisition of personal property by slaves. Many of these debates could be resolved by archeological investigation.

One of the earlier efforts to learn about Black life was the excavation of Black Lucy's Garden (Bullen and Bullen 1945). A reanalysis of these data (Baker 1980) and excavations at the Parting Ways community (Deetz 1977) have demonstrated that much of American Black architecture was influenced by the retention of African customs. Archeological investigations of nineteenth century free Black communities have gone a long way toward illuminating the role that Blacks have played in American history. Examples of Black community archeology include: Skunk Hollow on the Palisades of New Jersey (Geisman 1980); Sandy ground, a Black oystering village on State Island (Schuyler 1980); and Weeksville, an early predecessor of Brooklyn (Bridges and Salwin 1980). Excavations of slave cabins on the Kingsley Plantation, Florida (Fairbanks 1972) and Cumberland Island, Georgia (Ascher and Fairbanks 1971) have contributed considerable information on cabin size and slave use of material goods such as cookware. Others have examined the relative status indicators of plantation owners, overseers, and slaves (Otto 1980). All of these studies have contributed to our understanding of the almost "invisible" lives of historic American Blacks. The potential role of archeology and other disciplines to the study of Black history is nicely expressed by Kiple and King (1981:279) in their consideration of Time on the Cross:

Fogel and Engerman . . . have none the less by virtue of a truly multidisciplinary approach worked something of a methodological revolution in the study of slavery. It is not that economists, demographers, nutritionists, medical researchers, anthropologists, and the like have not had a great deal to say to historians about their subject, but rather that for the most part historians have heretofore been too preoccupied with other facets of their research to recognize the possibilities these disciplines contained. Yet, now that the exciting potential of a multidisciplinary approach has been demonstrated so vividly, rapid advances on a broad front seem inevitable.

Thomas and coauthors (1977:397) lament the fact that archeologists have paid little attention to historic burial populations and yet in the legal considerations of the significance of historic cemeteries it is not made clear how osteological analysis of historic skeletons can contribute

to history in general and Black history in particular. The osteological analysis of historic skeletons can contribute much more than the information on stature, diseases, and nonmetrical variations of historic Black populations called for by Dailey (1974:11). For example, Sutch (1976:269) states that the "inadequacy of our knowledge about the slave diet precludes a detailed analysis of its nutritional quality." Along the same lines Kiple and Kiple (1977:286) state that it is "not enough to simply calculate the potential yield of vitamins and minerals consumed, and pronounce a diet satisfactory or unsatisfactory." Lacking detailed fertility, morbidity, and mortality statistics what better way to assess nutritional adequacy than to directly examine its impact on the human body by analysis of historic human skeletons.

The osteological analysis of historic skeletons salvaged from cemetery destruction is not a recent phenomenon. For as long ago as 1930, Shapiro reported on 20 skeletons salvaged from the destruction of a cemetery by construction of the 207th Street Yard of the New York City Rapid Transit System. More recently, considerable amounts of osteological research have been devoted to the study of Black historic skeletons. In the Caribbean, slave burials have been reported on from the Virgin Islands (Dailey 1974; Ubelaker and Angel 1976), while extensive work has been done on slave archeology, history, and osteology from the Newton Plantation on Barbados (Handler and Lange 1978, Handler et al. 1982; Corruccini et al. 1982). Both slave and free Black skeletons from eighteenth and nineteenth century cemetery sites have been analyzed and reported: Bellview Plantation (Rathbun and Scurry 1983), Catoctin Furnace (Angel and Kelley 1983), Clifts Plantation (Angel n.d.), and College Landing (Angle 1977). These analyses, in some cases still in progress, have provided valuable data on Black diseases, diet, and quality of life. For example, analysis of bone lead content of the Clifts Plantation skeletons demonstrates differences in lead exposure and thus conditions of food preparation (i.e., use of lead based utensils) between members of the two races and their respective social positions. Additional information about Black social customs and the retention of African derived behaviors has been obtained from the study of historic Black cemetery surfaces and grave decorations (Combes 1972; Roediger 1981; Schuyler 1972).

HISTORY OF THE INVESTIGATION

The first evidence of the cemetery was the exposure, in the eroding river bank, of a skeleton. Mr. Jerry Thomas of the Corps of Engineers and representatives of the Arkansas and Lafayette County law enforcement agencies visited the site in the week following the first report on April 14, 1980. On April 24, 1980 Ms. Sandra Blaylock of the Arkansas Archeological Survey visited the site and determined that the historic burials were underlain by a prehistoric site. Revetment construction was directed around the location. Archeological evaluation of the prehistoric site was conducted to determine if it was eligible for the National Register of Historic Places (Schambach et al. 1982). Based on the results

of this evaluation it was determined that the prehistoric site was clearly a significant cultural resource (National Register of Historic Places 1980), and that mitigation of the adverse impact of revetment construction was necessary (Advisory Council on Historic Preservation 1980). At that time it was believed that the historic cemetery was quite small, perhaps only 5-10 graves. This evaluation was based on the field evidence and the recollections of local informants.

In this instance, New Orleans District was constructing a revetment on privately owned land in conjunction with Red River Levee District No. 1. As the assuring agency, the Levee District was legally responsible for removal of all obstructions, such as structures or cemeteries, from the right-of-way in order to provide a free and clear construction easement to the Corps of Engineers. In accord with applicable state laws the levee district obtained a Circuit Court order to this effect. Prior to the archeological investigations, the levee district and the Cedar Grove Baptist Church relocated the nine marked graves which had thus far been exposed.

Archeological investigations at the prehistoric component were directed to avoid any of the (it was assumed) few historic graves which might be encountered. The Scope of Services for the prehistoric site mitigation instructed the Arkansas Archeological Survey to:

Map and photographically record all historic grave stones and record all unmarked historic graves discovered during excavation. All historic grave locations shall be flagged but left undisturbed during site excavation. All information from head and foot stones will be recorded and photographed. The contractor will prepare a detailed map of the historic cemetery.

In the Documentation of No Adverse Effect prepared by the Corps of Engineers, it was stated that "documentation of the gravestone data from Cedar Grove is of local interest. Valuable demographic data might be obtained should a number of early graves be found."

As the excavations continued it became clear that there was a very large number of unmarked graves with no gravestones or other evidence of the individual's identity. Ultimately 126 historic graves were mapped. The substantial number of graves as well as the somewhat ambiguous nature of the earlier assessment of significance for the cemetery led to questions as to what removal measures were now appropriate. These questions arose in part due to the ambiguous character of the National Register eligibility of a cemetery. Cemetery evaluation varies somewhat from other, typical, cultural resources:

Ordinarily cemeteries . . . shall not be considered eligible for the National Register. however, such properties will qualify . . . if they fall within the following categories . . . (d) A cemetery which derives its primary significance from graves of

persons of transcendent importance from age, from distinctive design features, or from association with historic events (Federal Register 1976:1595).

The Office of the State Archeologist played a significant role in the initiation of evaluation of the status of the cemetery as a cultural resource. For purposes of clarification the New Orleans District of the U.S. Army Corps of Engineers requested evaluation of the cemetery's status from the Advisory Council on Historic Preservation and the Keeper of the National Register. The Advisory Council (February 25, 1981) and the Keeper (May 28, 1981) both concurred that the cemetery was eligible. As Carol Shull, Chief of Registration, notes in a letter to Colonel Sands:

Your letter has served to initiate a thorough reconsideration here of the Cedar Grove Cemetery's eligibility under our criteria as well as a review of our general policy with regard to cemeteries, both prehistoric and historic. As your letter correctly notes, cemeteries are not ordinarily considered eligible for listing in the National Register. The intent of this exception was to limit consideration of cemeteries, a ubiquitous property type that commonly carries considerable sentimental associations, but which individually may not have been subject to objective scholarly analysis to determine historic significance. However, cemeteries may embody values beyond personal or family-specific emotions; therefore, the National Register criteria allow the listing of cemeteries as exceptions when a cemetery is significant because of age, distinctive design features, graves of persons of transcendent importance, or association with historic events. The last has been interpreted broadly in a manner similar to criterion A " ". . . associated with events that have made a significant contribution to the broad patterns of our history." We have listed cemeteries in the past which exhibited significant characteristics in all of these areas, but will concentrate in this discussion on the "historic events" consideration. Cemeteries listed or determined eligible under this provision have been primarily one of two types: 1) those related to specific events, such as Civil War graveyards; and 2) those related to general events, illustrative of broad patterns, such as prehistoric burials which may yield "information important in the understanding" of broad patterns of our history (e.g., mortuary practices and physical effects of changing subsistence patterns). The information recoverable from these remains is generally unavailable elsewhere.

Similarly, our review of the documentation currently available has led us to the conclusion that most of the information which could be obtained by study of the remains at the Cedar Grove Cemetery is not available elsewhere. Both your letter and a telephone consultation with Beverly Watkins, who is preparing the historic research on the cemetery, indicate that there is a dearth of written material on the rural Black population

represented by the cemetery. Scientific study of these remains would result in valuable demographic and pathological information. This kind of data, especially when viewed in the context of information for different areas and/or varying socio-economic or racial groups, will increase our understanding both of the cultural patterns and living conditions of this rural Black community and how these may be illustrative of a broader post-Civil War phenomenon of the transition of a slave economy to one based on tenant farming with accompanying social, economic, and demographic effects.

Thus we are confirming our earlier determination that Cedar Grove Cemetery is an eligible historic resource, not only as a component of the site 3LA97, but on its own merit. We do not regard this decision as a blanket reading on the eligibility of cemeteries in general, but rather a determination that the particular circumstances of this cemetery and the people whom it represents qualify the property for the National Register under criteria A and D as specified in our regulations.

In June of 1982 the National Register published their draft "How to Apply the National Register Criteria for Evaluation." This document clarified the status of cemeteries stating:

A historic cemetery site that can provide information on demography and mortuary practices for a specific segment of the population which is not documented elsewhere (i.e. due to lack of information in county records, census data, etc. may be eligible) (1982:31).

The manual further elaborates:

Cemeteries may be eligible if they have the potential to yield important information. The information must be important within a specific context and the potential must be demonstrated. In addition to prehistoric cemeteries, historic cemeteries may be eligible for their information value if the expected information is important and is not documented elsewhere. A cemetery can qualify if it has potential to yield important information because of its association with prehistoric or historic events provided that the information it contains is not available in extant documentary evidence. For example, a cemetery associated with the settlement of a particular cultural group may qualify if it has the potential to yield important information about subjects such as demography, variations in mortuary practices, or the study of the cause of death correlated with nutrition or other variables. A cemetery would not qualify on the basis of its potential to yield important information if it does not have integrity, if the information is available in documentary sources, or if the information it contains is not important (1982:57).

Unfortunately such clear guidance was not available in 1981. The evaluation of the National Register and Advisory Council clarified the regulatory issues, but important legal issues and the desire to identify and comply with the wishes of the local community remained.

As noted above prior to the detailed evaluation of the cemetery's National Register status, the levee board had obtained a court order to relocate what was thought to be a small marked cemetery using procedures normal for relocation in projects of this type. The National Register status of the much larger unmarked cemetery dictated that appropriate measures should be used which would recover the important scientific information which was the basis for the property's eligibility.

The New Orleans Corps of Engineers consulted with the Elders of the Cedar Grove Baptist Church to determine their wishes and concerns. The characteristics of the cemetery and the alternative approaches to its relocation were discussed. The wishes of the Church were formalized in a communication of April 16, 1982 (Figure 1-1).

A proposed mitigation plan was developed by Ms. Carroll H. Kleinhans of the U.S. Army Corps of Engineers. The plan documented the investigation's goals, the basic methodological approach to be used, and the constraints under which the project must be conducted. This plan was reviewed and agreed to by the Arkansas State Archeologist, the State Historic Preservation Officer, and the President's Advisory Council on Historic Preservation.

During the week of May 10, 1982, unexpected heavy rains in Oklahoma and Texas caused the Red River to rise the following week by more than 6 m. Increased stream velocity led to scouring of the unrevetted sides of the small peninsula of the cemetery. In addition, when the water returned to its earlier level, heavy slumping could be expected. Under such conditions it was not unusual for up to 20 m of bank to collapse as a unit into the river.

As a result, efforts to relocate the cemetery took on a great urgency. Not only was it possible that the property would be lost, it was also very probable that the already constructed portions of the revetment could also be damaged. Continuing upstream rains increased the emergency status of relocation.

The Corp's mitigation plan was submitted to the Lafayette County Circuit Court, who on June 9, 1982 issued a court order for the relocation of the cemetery stating:

It is therefore, by the Court, **CONSIDERED ORDERED AND ADJUDGED**, that the Cedar Grove Cemetery be relocated to a 0.5 acre tract of land deeded to the trustees of the Cedar Grove Baptist Church by W. H. Triplett, Jr. and Christene Triplett his wife; that the

25 APR 82

Cedar Grove B.C.
P.O. Box 199
Louisville, Ark.

To Whom It May Concern:

We The Members of The Cedar Grove
BAPTIST Church, In a Special Call Meeting
Concerning The Santell Cemetery, It is
The Decision of The Church Body,
That These remains be studied upon
removal, And reburied within 24-Hours
We feel this will be better an everyone
one involved. This was done by order's
of the church.

Rev. H.S. Mc Graw
PASTOR

Hollis SASSER
CLERK.

Figure 1-1. Letter from Cedar Grove Baptist Church.

relocation be conducted according to the Proposed Mitigation Plan, Cedar Grove Cemetery, 3LA97, copy of which is attached here to and made a part here of by reference.

Concurrently, the Mitigation Plan was translated into a Scope of Services and issued as Modification P0002 to the active contract DACW29-81-C-0059 under which the Arkansas Archeological Survey had conducted the initial mitigation fieldwork on the prehistoric site. The contract modification was awarded on June 15, relocation began the next day and was completed July 2, 1982.

The primary goal of the Scope of Services was to allow the recovery of as much of the important scientific data as was possible within the constraints of the mitigation plan. The secondary goal was to complete a preliminary inventory of this data and prepare a descriptive report of findings. The Scope focused on only limited field data recording based primarily on photographic documentation. It called for the excavation of all graves within the direct impact zone of the Red River Revetment project, collection of osteological and artifactual data from each grave lot, reburial of all remains, and preparation of a final manuscript which would report upon and describe the data collected. It also calls for a report which would provide artifact and skeletal (i.e., age at death, sex, race, etc.) descriptions by grave lot, estimates of date of interment, evaluation of the skeletal demographic profile, description of the mortuary practices and burial customs, and an evaluation of the significance of these data to an understanding of the post-Civil War transition from slavery to tenant farming. This report is submitted in fulfillment of the above listed and described Scope of Services.

All the above requirements of the Scope of Services are fully met in this report. It should be emphasized further that the full range of information recovered are only preliminarily analyzed. Complete investigation of this exceptionally important, diverse and substantial body of data was beyond the Scope and the project limitations. Long term analysis and evaluation are necessary to fully consider this very significant data. For this latter aspect, this report serves as a guide for further investigations.

Since this project is one of the first of its kind we have also attempted to self-assess the fieldwork protocol and other aspects of the analysis. Where we have felt that there are deficiencies as well as strengths we have attempted to frankly present both. It is our hope that such an assessment may serve as a useful guide to other similar investigations which may occur in the future.

FORMAT OF THE REPORT

Chapter 2 by Watkins contains the historical background information

and interpretations. Chapter 3 provides a description of the archeological data and interpretations from the 1980 excavations which are pertinent to the historic cemetery. Chapters 2 and 3 have been adapted from the versions published in Trubowitz 1983. Chapter 4 describes the excavation and laboratory protocol designed for the cemetery excavation, as well as the methodologies actually employed during the excavation and analysis of the Cedar Grove Cemetery grave lots. Chapter 5 provides the description of the artifactual and skeletal contents of each grave lot as specified in the Scope of Services. Chapter 6 provides a discussion of the mortuary practices, demographics, paleopathology and genetic affinities of the excavated Cedar Grove burials. Chapter 7 evaluates the significance of the Cedar Grove Cemetery data to the broader domain of Black American history and specifically to the Post-Reconstruction period. Chapter 8 provides a short summary of the entire report with an emphasis upon the significance of the Cedar Grove Cemetery. Finally, Chapter 9 is an initial attempt to list the problem domains and research goals which will be addressed by future research and analysis of the Cedar Grove Cemetery. Appendix III contains all the raw data tables compiled during the postexcavation research phase. Appendix IV provides pertinent Section 106 compliance documentation initiated by the U.S. Army Corps of Engineers, New Orleans District. Appendix V is data base management protocol prepared for the proposed analysis of the Cedar Grove data.

Chapter 2

HISTORICAL BACKGROUND

by Beverly Watkins

EARLY EXPLORATION OF THE RED RIVER VALLEY

Europeans first came to the Red River Valley in the late 1600s as the Spanish expanded their missionary work among the Indians of east Texas. The expedition of 1691-1692 led by Don Domingo Teran de los Rios was the third official campaign and was the only one to reach the Red River Valley (Hatcher 1932:32-35). Political problems in Mexico, however, made it impossible for the Spanish to support a mission so far away, and they lost contact with the Caddo.

The French were the first to directly influence life along the Red River. In 1719 Jean-Baptiste Benard de La Harpe established a post on the Red River in what is now northeast Texas. His purpose was to establish trade with the Spanish, but he also began trade with the Indians (Wedel 1978). Other French traders and their families soon followed, some living in a Caddo settlement as early as 1737 and remaining in the area for many years (Sibley 1805:729). Still others were seasonal or transient traders following the pattern of the French-Canadian voyagers, and there is little documentation of their activities.

When the United States purchased Louisiana from France in 1803, American officials had little information about the new territory. The need for accurate information was acute in the Southwest, along the Red River, where the boundaries of Louisiana were to be the same as under the French, but where the division between the French and the Spanish had always been vague.

Thomas Jefferson, long interested in science and exploration, thought government supported exploring parties would be the best way to get reliable information, and as soon as Lewis and Clark left for the Northwest, he turned his attention to the Red River Valley. Late in 1803, Jefferson requested permission from Congress to send a party up the Red River. Congress agreed, and plans were begun for an expedition to determine the location of the source of the river and to ascertain the boundaries of Louisiana (Flores 1976:1-2; Watkins 1977:13).

Originally planned for the winter of 1804, the expedition had to be postponed because of the opposition of Spanish authorities. In the

meantime, the President asked John Sibley, the United States Indian Agent at Natchitoches, to supply detailed information on the river and tribes that lived along it. Sibley, who had never been up the river, based his report on information from Francois Grappe, a Frenchman who had lived and traded on the river for more than 30 years. Sibley described the banks of the Red River above the mouth of the Sulphur Fork (which he called Little River of the left) as a series of canebrakes interrupted by prairies (Figure 2-1). He described Long Prairie as handsome and rich, "bounded by handsome oak and hickory woods, mixed with short leaved pine, interspersed with pleasant streams and fountains of water." He also mentioned Little Prairie (Fisher Prairie at Garland City), an oak and pine bluff (probably Boyd Hill), and a stand of cedars stretching along the river for many miles before reaching Little River. The distances Sibley gives are misleading, being roughly twice the actual distances between landmarks, but he was dependent on others for his information (Sibley 1805:728-729).

The Red River expedition began reorganizing in 1805 and finally got underway in June 1806, led by Colonel Thomas Freeman, a surveyor. The party included naturalist Dr. Peter Custis, Captain Richard Sparks, Lieutenant Enoch Humphreys, two noncommissioned officers, 37 soldiers, and a Black servant plus guides and interpreters. After a 14-day struggle around the Great Raft, and another 15 days at the Coushatta village, the expedition reached Arkansas on July 13. The party continued up the river for another 16 days, describing the country through which they traveled as a series of canebrakes and prairies. Although they visited the sites of several abandoned Caddo villages (see Wedel 1978), they did not meet anyone living in the area. On July 29, they were confronted by a large force of Spanish soldiers whose commander demanded that the exploring party retreat. Since Freeman had been instructed not to fight a superior force, the expedition withdrew. The return trip to Natchitoches took 25 days (Watkins 1977: Flores 1976).

SULPHUR FORK FACTORY

In 1795 the United States government began operating a system of posts, called factories, for regulating trade with the Indians. As Americans began settling in Louisiana and developing commercial relations with the Indians, a factory was established at Natchitoches to oversee trade and to administer Indian affairs in general. Problems over the location of the factory buildings as well as conflicts with the local merchants made it advisable to move the factory farther up the river.

With this in mind, John Fowler, the factor, made an inspection tour up the Red River in April and May 1817. The location he recommended was on a high bluff on the west bank of the Red River near the mouth of the Sulphur Fork. Fowler chose this site because the Indians were already coming to that area to hunt, and because unscrupulous private traders were operating there. The site also offered the opportunity to trade with Indians who lived too far away to come to Natchitoches, and Fowler mentioned villages of Coushattas, Delawares, Caddos, and Pascagoulas (Magnaghi 1976:288-289).

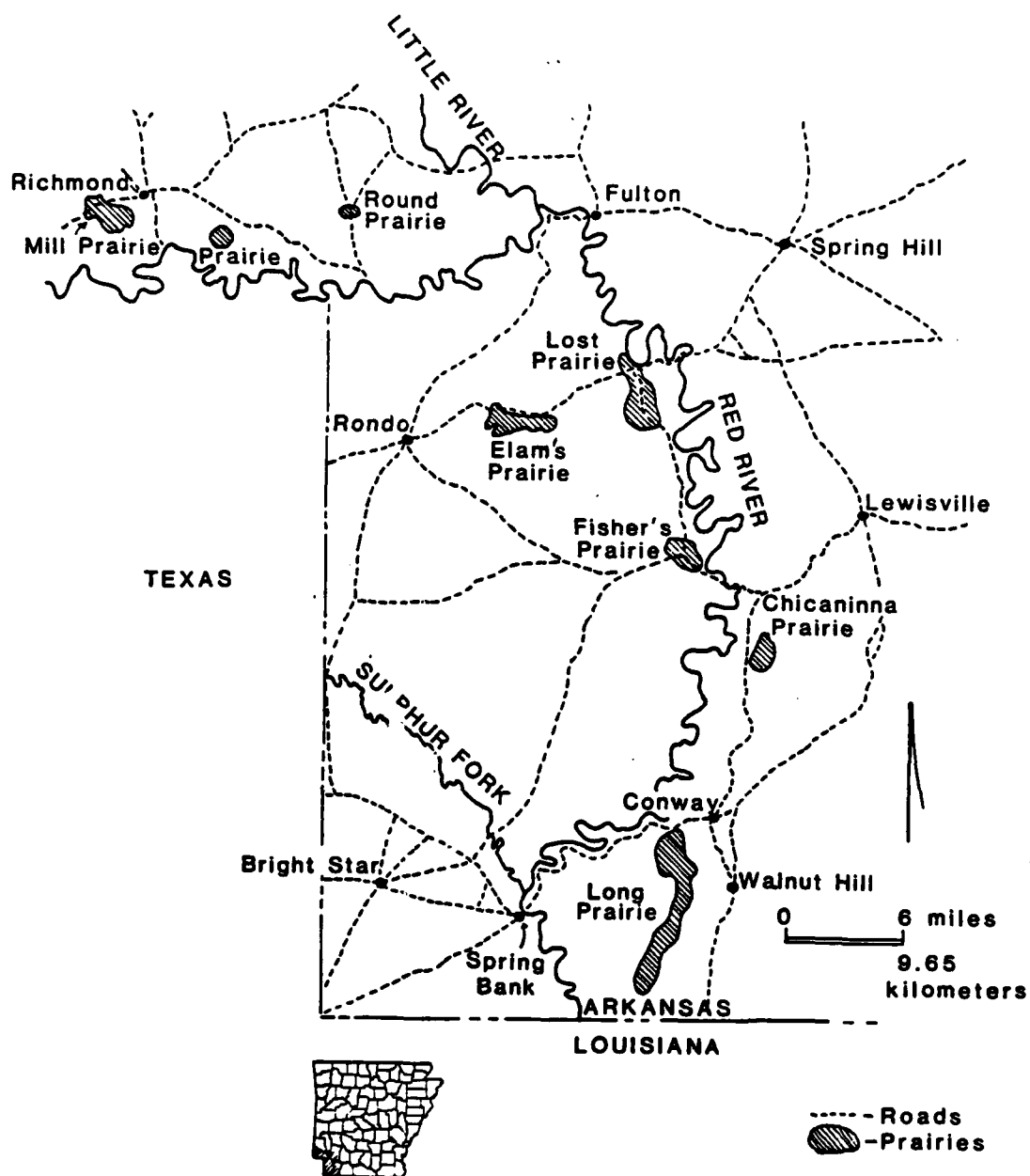


Figure 2-1. Early historic settlements in southwest Arkansas (after Venable 1865)

Fowler received permission to move late in the year, but it was May 1818 before construction was actually begun at the new site. Choosing a location about a kilometer below the mouth of Sulphur Fork, Fowler left the highest part of the bluff for a military post and built the factory on an adjacent site. Although there were many construction problems, by May 1819 the complex included a two-story combination store and dwelling, a smaller two-story skin and fur house, a cookhouse, and temporary buildings used as a guardhouse and for storage. A ferry was built later to allow the Indians to hunt on the east side of the river (Magnaghi 1976:173-174, 181).

While construction was proceeding, Fowler began making contacts with the nearby tribes. He visited the chiefs of the Pascagoulas, Alabamas, and Coushattas, presenting them with gifts and inviting them to the factory. Oriley Colton, Fowler's interpreter, visited the Cherokee, and invitations were also sent to the Delaware and Shawnee who had settled on the Red River above the factory. The Caddos posed a special problem because eight of their 10 villages were on Spanish territory and their chief was hostile to the Americans. Fowler was upset by threats made by the Caddo chief, but John Jamison, the Indian Agent at Natchitoches, reassured him that the chief could only raise 500 warriors and that the army could handle them (Magnaghi 1978:174-175).

Congress abolished the factory system in 1822, and substituted agents who would license private traders. George Gray took over the buildings, and the Sulphur Fork Factory became the Red River Indian Agency. Gray stayed at the site until 1825 when he moved his agency downriver to Caddo Prairie to be closer to the Indians. Collin Aldrich, one of the private traders, continued to use the buildings (Carter 1951:47, 117).

EARLY SETTLEMENTS

While the factory was wrestling with the problems of Indian trade, American settlers were beginning to develop the eastern side of the Red River Valley. Fowler reported in 1817 that there were 130 White families settled along the east bank of the river between Sulphur Fork and Saline Creek. He made several trips among these settlements hiring farmers and slaves to help with construction at the factory (Magnaghi 1978:170, 173).

The first settlers were herdsmen who made their living grazing livestock on public lands. They settled first on the natural prairies where the rich grasses and nearby canebrakes made it possible to manage large herds of cattle and swine with a minimum of effort (Owsley 1969:6). Long Prairie, just across the river from the factory, was one of the first areas to be settled. Among the early residents were the Conway family (prominent in Arkansas politics), and Stephen F. Austin who established a farm on Long Prairie as early as 1818 to use as a way station and supply base for his colony in Texas. Austin intended to use his farm to raise cattle to sustain his colony until it became self-sufficient, but the site was unhealthy and that aspect of the project was abandoned (Barker 1926:24-25).

The herdsmen who first settled the prairies were soon displaced by agricultural settlers who bought the rich lands and cleared and fenced them (Owsley 1969:4-7). The importance of the prairies to the developing agriculture in the valley can be seen in the pattern of settlements and the post offices for them. There were enough people at Long Prairie in 1824 to justify a post office; the first post office west of the river was at Lost Prairie in 1828. When Lafayette County was organized in 1827, commissioners decided to establish the courthouse at Chicaninna Prairie about 19 km north of Long Prairie (Arkansas Gazette June 1, 1824, June 4, 1828; Hempstead 1890:934).

THE GREAT RAFT

One of the major impediments to the development of the valley was the Great Raft of the Red River. This was a series of natural rafts and log jams where logs, stumps, and other debris clogged the channel so thoroughly that trees could grow on top of it, and stretches of the river could be traveled on horseback. Beginning north of Natchitoches, the raft was estimated to be 160 to 225 km long, ending near where Shreveport now is (Arkansas Gazette April 11, 1826; Mills 1978:14-15, 22). It was possible to get around the raft through a series of bayous and lakes that paralleled the river, but these routes were only adequate for the smaller keelboats. As a result, trade with the settlements above the raft was limited.

Early attempts to cut through the smaller portions of the raft were unsuccessful and by 1825 the citizens of Long Prairie were seeking government help. The first government attempt to remove the raft began in 1830 by the Corps of Engineers. The effort was inadequate at best, since the appropriation was for only \$25,000. While work was being done on the foot of the raft, the head of the raft was building up the river at a rate of 1 to 2 km a year (Arkansas Gazette October 27, 1830).

Enough improvement was made to allow the first steamboat to ascend above the raft in 1831. Leaving Natchitoches the middle of May, the Alps (which was renamed the Enterprise) reached Long Prairie on June 16. Owned by Benjamin R. Milam, it was a small boat of 30-40 tons burden and was loaded with provisions for the Army post, Ft. Towson, at the Kiamisha River. The boat stayed at Long Prairie for two days then headed upriver reaching Lost Prairie a few days later (Arkansas Gazette June 22, June 29, July 6, 1831).

The successful trip of the Alps marked the start of regular commerce on the river, but the problems of the raft remained. It was not until 1838 that the river was finally cleared, a task which took Captain Henry Shreve six years to complete, even with a specially built boat and crews of up to 300 men. The job cost \$300,000 but Shreve estimated that the value of usable land along the river increased by \$15 million because of increased access to trade and because some lands which had been permanently flooded were drained (Mills 1978:21-22).

PLANTATION AGRICULTURE

As the herdsmen were replaced by agricultural settlers, the Red River Valley in Arkansas experienced a period of population growth. Lafayette County, which included both the current Lafayette and Miller counties, grew from 748 in 1830, to 2,200 in 1840, to 5,220 in 1850, to 8,464 in 1860. Hempstead and Sevier counties (which included the present Little River County) experienced similar gains.

The clearing of the raft made it feasible to establish large slaveholding plantations on the rich lands of the bottoms, since produce could be shipped directly down the river. Because Lafayette County experienced its greatest growth at the height of the westward expansion of the Cotton Kingdom, many of its plantations were owned by land speculators and other outside investors. Some of these absentee owners lived as close as Lewisville, others as far away as Alabama; several lived on the Red River in Louisiana. Overseers were responsible for the day-to-day operation of the plantations and a great deal of attention was given to efficient and "scientific" management (Taylor 1959:90-92; Fogel and Engerman 1974:1:199-203; Taylor 1958:102-107; Genovese 1974:11-21).

Although cotton was the primary commercial crop (1,977 bales in 1850), the plantations grew a wide variety of grains and food crops. The 1850 census listed substantial quantities of rye and oats, corn, Irish and sweet potatoes, peas and beans, and rice being grown in Lafayette County, as well as lesser amounts of wheat, hay, and clover seed. A large number of swine were raised as well as cattle, horses, mules, and sheep. Animals slaughtered in 1850 were valued at \$25,555. Other agricultural products included wool, butter and cheese, and beeswax and honey (DeBow 1854:200-205).

The slave population grew as the plantations expanded. In 1830 Hempstead County had the largest number of slaves in the state, and Lafayette County was fifth. By 1860, Hempstead County ranked fifth in number of slaves, and Lafayette County eighth, but Lafayette had slightly more slaves than Whites--4,311 out of a total population of 8,464. Statewide in 1860 the average slaveholding was 9.6, while the average number of slaves per owner in Lafayette County was 15.9 (Taylor 1958:26, 52, 56).

Life on the plantations followed the basic patterns established in the cotton growing areas of the Southeast. The fieldhands were organized into workgangs whose tasks changed with the seasons--clearing, plowing, planting, cultivating (chopping), picking, ginning. Other slaves cooked, sewed, tended children, worked as servants, or cared for stock. Not all work was agricultural, and slaves were often hired out to work on roads and levees or to work for the United State government in keeping the Red River clear of rafts (Taylor 1958:82-85, 89, 115). It was customary in northwest Louisiana to allow slaves land for gardens, and many raised vegetables and chickens to supplement their rations (Genovese 1974:535-536). This custom probably prevailed in Arkansas as well.

One way in which plantation life was different in the Red River Valley from that in the older Southern states was in the extent to which the slaves were exposed to religious instruction. By the time Lafayette County was settled, the acrimonious battles over the spiritual needs of slaves had been resolved and teaching slaves the Christian faith was no longer controversial (Genovese 1974:184-188). The Red River Valley in Arkansas, because of its large slave population and the number of absentee owners, became the focus of missionary efforts by both the Baptist and Methodist churches.

The Methodist Church began its organized work among the slaves in the southwest corner of the state when the Arkansas Conference established the Red River African Mission in 1840 or 1841. Membership in the mission varied from 103 in 1845, to 220 in 1850, and ministers were regularly appointed to the post by the conference. These pastors served both the slaves allowed in White churches and those in separate slave congregations.

Baptist work among the slaves was not as organized as the Methodist efforts because of the Baptist tradition of decentralization. Much of the mission work was left to local churches and associations. The Red River Association was one of the most successful in this work--at one time it was supporting four missionaries to the slaves. The Arkansas Baptist Convention, organized in 1848, was concerned that the large number of absentee owners in Lafayette County was reducing the opportunities the slaves had for religious training, and dispatched a missionary to meet the special needs of the slaves (Taylor 1958:172-174, 181-183).

As the plantations expanded, towns developed along the river and on the high ground at the edge of the valley to serve the planters. Conway, Walnut Hill, Richmond, Spring Hill, and Laynesport were all close to the river (Pelham 1848), while Lewisville was established in 1841 in the hills as the new county seat (Hempstead 1890:934). The largest and most important town was Fulton, which grew from an early ferry landing to become the trading center for the valley. In 1844 Fulton had seven merchants, a candy store, three taverns, and a bowling alley, as well as two doctors, two blacksmiths, and a carpenter. A gin and mill and the ferry rounded out the commercial enterprises (Goodspeed 1890:385). Roads from Little Rock, Pine Bluff, and Camden converged at Fulton to cross the Red River before continuing into Texas (Venable 1865).

CIVIL WAR

For most of the Civil War the southwestern corner of Arkansas was far from the scenes of military action. Life went on much as usual, even after the state capital was moved from Little Rock to Washington, Arkansas in 1863, although the population was greatly enlarged by refugees from areas occupied by the Union Army. The plantations stored their cotton that could not be sent to market because Union forces controlled New Orleans and the mouth of the Red River, and concentrated on raising foodstuffs. Things changed, however, when the Red River became the focus of Union strategy in the spring of 1864.

The overall Union strategy was to split the Confederacy. One army captured the Mississippi River; another fought its way into Atlanta. A third moved to capture the Red River Valley and separate Texas from the rest of the South, ending its role as a warehouse for cotton and a supply route from Mexico. This was to be done by having General Frederick Steele march south from Little Rock to join the forces of General Nathaniel P. Banks moving up the river. The fighting never reached southwest Arkansas. Banks was turned back while still south of Shreveport; and Steele turned east, away from Washington, before being forced to retreat to Little Rock because of a shortage of food and forage (Johnson 1958).

Steele's expedition badly frightened the state officials and local citizens. Fighting at the battle of Prairie DeAnn came within 13 km of Washington, and it had been necessary to remove the state government across the Red River to Rondo for safety. The measure of safety was small, however, as no effort had been made to protect the major crossings. Some residents reacted by fleeing into Texas with their slaves. The Confederate Army, fearing another excursion by Steele in the spring of 1865, applied itself to fortifying the river crossings, and built major earthworks at Fulton and Dooley's Ferry (Venable 1865; Magruder 1864a, 1864b; Smith 1865). The earthworks were never tested because the war ended before Steele could launch another campaign.

TENANT FARMING

The post-Civil War period was a time of change and uncertainty all across the South. The hopes and aspirations of the newly freed slaves stood in direct conflict with the views and desires of their former owners. The planters wanted to reestablish a disciplined work force to farm their land (Roark 1977:111-155), while the freedmen wanted to exercise their freedom, restore family ties broken by separations, and acquire some land of their own (Litwack 1979; Gutman 1976; Magdol 1977; Oubre 1978).

The most pressing problem in the Red River Valley of Arkansas, as elsewhere, was the change from slave labor to wage labor on the plantations. As early as 1862, General Benjamin F. Butler began a system of compensated labor in the portions of Louisiana under federal control. His plan called for contracts between the planters and the laborers for an entire season. The compensation was to include housing, rations, medicine, a garden plot, and wages or a share of the crop. Although physical punishment was forbidden, laborers were required to work or face punishment by the local military authorities. As the area under federal control increased, General Nathaniel Banks, Butler's successor, extended this contract-labor system until it was in use in most of the Mississippi Valley (Roark 1977:114).

This practice continued after 1865 with the contracts being handled through the Freedmen's Bureau. The first contracts were usually with a group of freedmen to work an entire plantation (e.g., Sentell 1865), but this soon proved cumbersome and inefficient. Instead the landowners

divided their plantations into "farms" and contracted with one man to work each parcel (e.g., Worley 1954). Although the specifics of these contracts varied, usually those with a group of freedmen provided for wages and included strict rules of work and behavior, while the contracts with individuals promised the laborer a share of whatever crop was grown, typically two-thirds of the corn and three-fourths of the cotton. In both cases the landowner furnished housing, tools, and seed, but in the first instance the laborers were expected to provide their own food and clothing out of their wages, while in the second case the landowner advanced food and clothing against the laborer's share of the crop.

Changes in types of labor contracts brought about changes in the landscape as well as in the work methods. Under the early group contracts the freedmen continued to live grouped together under the supervision of the landowner or his agent. As the land was parceled out to individuals, however, the laborers disbursed as each family established a house on the farm they were working (Coulter 1947:tenth illustration following page 224). Although this gave the laborers some control over their parcel, it still did not meet their desire to own land.

It was widely believed that the Freedmen's Bureau would confiscate the land of former slaveowners and distribute it to former slaves in 40 acre (16.2 ha) lots (Oubre 1978; Litwack 1979:399-407). This distribution of land did not take place, and the freedmen lacked the resources to take advantage of the public lands made available under the Southern Homestead Act of 1866 (Magdol 1977:139-173, 191). The result of these difficulties in obtaining land left the laborers dependent on the landowners, and trapped in the sharecropping system where it was difficult to get out of debt (Rosengarten 1975; Daniel 1973). In Arkansas in 1875 only about 2,000 freedmen owned some type of real property. In 1910 of all the non-White farm operators in the state (owners, tenants, or whatever) only 23% were Black farm owners (Magdol 1977:212-213). In Lafayette County in 1930, in a population that was 50% Black and which had experienced steady growth since 1880, 80% of the farms were operated by tenants (Arkansas State Planning Board 1936:15, 19, 36).

RIVER AND RAILROAD

Neglect of the Red River channel after it was opened by Captain Shreve had allowed the raft to re-form in northern Louisiana above Shreveport. The Corps of Engineers tackled this obstacle again in 1872, and the channel was open once more in 1873 (Mills 1978:52-54). Even so there were continuing problems with obstructions that contributed to the decline of river traffic once the railroads were built.

The coming of the railroads caused significant changes in the Red River Valley. The Cairo and Fulton Railroad (later the Missouri Pacific) completed its bridge over the river at Fulton in March 1874, opening the line to traffic from Texas to St. Louis. The river was bridged again in the early 1880s, this time at Garland, by the Texas and St. Louis Railroad (St. Louis and Southwestern).

The effect was the same everywhere. Because the railroads provided more reliable transportation and shipping than the river, commerce flourished along their routes--construction camps and interchange points became booming cities while older towns died out. In Lafayette County, a town called Galveston, on the railroad just under a kilometer from Lewisville, soon became known as New Lewisville, and then took the place of Old Lewisville as the county seat (Hempstead 1890:934-935). On the Red River, Fulton lost its importance as a cotton port and was reduced to a minor shipping point on the railroad, while Texarkana, at the junction of three railroads, became the region's commercial center.

FLOODS AND LEVEES

Although trade patterns shifted to the railroads, the Red River continued to dominate life along its bottomlands. The river's high waters, floods, and channel cutting activity were a constant concern to residents and landowners. Even before the Civil War some plantation owners tried to protect their land by raising levees to control the river. These slave-built levees were too low to contain the river and there was little coordination between landowners, so the effort was not effective.

Serious flooding along the Mississippi River in the 1870s, made worse by a piecemeal levee system, led to the formation of the Mississippi River Commission in 1879. Formed to coordinate levee building efforts along the Mississippi River and its tributaries, the commission encouraged the formation of local levee boards to oversee this work, and the Corps of Engineers was authorized to give advice to these local groups. Along the Red River in Arkansas the banks were laced with protective earthworks by 1887 (U.S. Army Corps of Engineers 1892:sheets 1-11).

Lack of coordination between boards, and inconsistency of construction standards made these levees ineffective. Following a record flood in 1892, residents began petitioning for help. The Corps of Engineers was slow to respond, however, because the Corps was limited to building levees to improve navigation, and it felt that the amount of navigation on the river in Arkansas did not justify the expense. The locally sponsored work continued and in 1905 two levee districts were chartered by the state, Red River District No. 1 and Long Prairie District. These governmental units had the power to assess taxes to raise funds for building and maintaining levees and could match funds with the federal government for flood control work (Harrison and Kollmorgen 1947:413-414). Finally in 1925 Congress approved a comprehensive survey of the Red River to determine the best means of flood control (Mills 1978:112-114, 21).

The Red River survey had not been completed when the Mississippi Valley was devastated by the 1927 flood. Over six million hectares were flooded in seven states, including the Red River Valley in Arkansas from the Louisiana line to just above Index (Daniel 1973:85). Water washing through breaks in the levees, called crevasses, created deep pools known as blue holes. Then the water was held by the levee system and it was

necessary to dynamite at least one levee in Lafayette County to allow the floodwaters to drain back into the main channel of the river. Homes were lost, farm buildings were destroyed, and so much silt was deposited on the land that it was several years before the land could be farmed (Nutt 1980).

POST-1927

The Red River Valley of Arkansas today is still an area of large scale agriculture. The widespread destruction of the 1927 flood, the Great Depression of the 1930s, and the mechanization of farming have all contributed to the decline of the tenancy system, at the same time that the promise of good jobs in northern industries lured young people away from rural south Arkansas. The size of landholdings has increased as new methods and machines have given a new dimension to the old plantation system and made only the large farms efficient.

Cotton is no longer the main commercial crop. Many farms now concentrate on soybeans or rice, while others have become cattle ranches. The railroads retain their key roles in shipping while the interstate highway system has reinforced the importance of Texarkana as the regional center of trade and the gateway to Texas that Fulton once expected to be.

HISTORIC DOCUMENTATION OF THE CEDAR GROVE LOCALITY

The land that includes 3LA97 was bought from the U.S. Land Office in 1834 by Thomas M. Barnett of Montgomery, Alabama (Lafayette County Land Entry Record). Barnett had moved from Georgia to Alabama in 1817 where he purchased a large number of acres of unoccupied prairie land which he made into a prosperous plantation (Owsley 1969:24; Robertson 1892:72-73; Weekly Alabama Journal September 26, 1857). There is no indication that Barnett intended to move to Arkansas when he purchased the land in Lafayette County, rather the amount of land he bought (portions of 14 sections) suggests an investment, a common practice (Eaton 1971:390). Barnett apparently selected the lands himself, although a portion of the purchase may have been for friends and neighbors, for in 1839 he deeded part of the property to David Gilmore, also of Montgomery (Lafayette County Deed Record C:374).

By 1850 the Barnett Plantation included 600 improved acres (about 243 ha) worked by 65 slaves. The land was valued at \$6000 plus \$1200 for tools and implements. Livestock included 3 horses, 9 mules, 16 milk cows, 8 working oxen, 60 other cattle and 200 swine given a total value of \$2200. In addition, animals worth \$440 were slaughtered during 1850. The small number of work animals suggests that this may have been a stock-raising operation rather than a cotton plantation, especially since its only agricultural product was 5,000 bushels of corn (U.S. Census 1850a: Lafayette County, Roane Township; 1850b:Lafayette County, Roane Township).

In 1851 Barnett turned his attention to his Tallassee Factory, an establishment near Montgomery noted for the manufacture of slave cloth, and

he gave power of attorney over his Red River property to his son Nicholas D. Barnett and his son-in-law Benjamin H. Micou. He gave them control of the plantation, slaves, stock, provisions, and all other property to cultivate or sell (Weekly Alabama Journal September 26, 1857; Lafayette County Deed Record F:181).

Within two months Micou, acting as Barnett's agent, sold the plantation to William A. Higgs and James R. McClintock. The transaction included 963 acres (about 387 ha) and 65 slaves plus all "privileges and appurtenances." In order to pay for the property, Higgs and McClintock mortgaged the land and slaves against eight bonds maturing from 1853 to 1860 and totaling \$60,000. In addition Higgs and McClintock each took a mortgage on his half interest in the slaves as security for the bonds (Lafayette County Deed Record F:182-190). Early in 1853 Higgs sold his interest in the land and slaves to James B. Gilmer of Bossier Parish, Louisiana. McClintock, who apparently lived on the plantation and ran it for the partnership, acted as Gilmer's agent in the sale (Lafayette County Deed Record F:358). McClintock added adjoining property to the plantation, including the entire sixteenth section which he bought from the school commissioners in 1855 (Lafayette County Deed Record J:392-393; Lafayette County Land Entry Record).

By 1860 the plantation, still known as the Barnett Place, included 1,190 improved acres (about 481 ha) and 1,890 unimproved acres (about 720 ha). The work force had grown to 137 slaves (in 27 houses). This made McClintock's operation well above the average both in acreage and number of slaves (Taylor 1958:56-58). The plantation had livestock worth \$8640 including 16 horses, 36 mules, 2 jacks or jennies, 8 milk cows, 20 working oxen, 28 other cattle, and 140 swine. Production for the year included 2,000 bushels of corn, 426 bales of cotton, and 100 pounds of butter (U.S. Census 1860a:Lafayette County, Roane Township; 1860b:Lafayette County, LaGrange Township).

Gilmer died in 1853, but McClintock ran the plantation as a partnership until 1860 when Gilmer's heirs requested a division of the property. The agreement called for the Barnett Plantation (the original 963 acres--about 387 ha--plus section 16), both real and personal property including the slaves to be divided equally, with the stipulations that 82 bales of cotton from the previous year be sold and the proceeds divided. The \$600 from hiring out Owen, a slave blacksmith, would go to McClintock. The partnership still had to redeem the final mortgage bond from the Barnett estate and also owed merchants in New Orleans for supplies. In order to assure that these debts would be paid, McClintock and the Gilmer heirs each mortgaged their portion of the land to the other party (Lafayette County Deed Record J:377-382, 394-398). The Gilmer heirs got the property that includes the Cedar Grove site, 3LA97 (Lafayette County Deed Record J:394-396).

In 1862 McClintock sold his portion of the property (744 acres or 302 ha) to Francis W. Armor; and in 1863 the Gilmer heirs sold their portion (755.5 acres or 302 ha) to George W. Sentell and John M. Prather of Bossier Parish, Louisiana for \$22,665. The slaves apparently had been moved from

the property for there is no mention of them in either deed (Lafayette County Deed Record K:359, 534). Armor settled on his property with 32 slaves of his own; Sentell and Prather stayed in Louisiana but may have worked their land under the supervision of John Sentell, George's brother, a merchant who lived nearby (Lafayette County Real Estate Tax Record 1862, 1865; U.S. Census 1870:Lafayette County, Lagrange Township). In 1869 Prather deeded his interest in the property to G. W. Sentell for \$4750. At that time both men were residents of New Orleans (Lafayette County Deed Record O:75).

Sentell expanded the plantation, eventually buying the Armor property and much more. The Sentell family continued to live in Louisiana, near Plain Dealing, while work on the plantation was done by tenant farmers.

The contract for 1865 between the Sentells and the freedmen on their plantation called for the Sentells to furnish "full and substantial rations, sufficient fuel and quarters, and all needful medicines," and to pay each worker a monthly wage. This wage ranged from \$6 to \$15 per month depending on the person's ability to work in the fields. In addition each "best male hand" was to be furnished one acre (about half a hectare) of land, probably to use as a garden. For their part the workers agreed to give "good and faithful service," not to be absent during working hours without permission and to work 26 days in every month, "half of every Saturday excepted." The freedmen also agreed to a set of rules: to begin work at sunrise and work 9 to 11 hours depending on the month; to take care of the tools and pay for any lost or broken; to do necessary chores even on Saturday evenings and holidays; to settle disagreements without quarreling; to refrain from thieving or stealing; and to keep no livestock except poultry. The terms of this contract were typical for that time, and 28 workers agreed to its terms, including six couples with 21 children (Sentell 1865; Coulter 1947:76-77). Contracts for wages were soon replaced by sharecropping agreements, with the landowner typically getting a quarter of the cotton crop and a third of the corn crop.

In 1896 following G. W. Sentell's death, his children sold their interests in the property to their mother, Mildred A. Sentell for \$28,000 (Lafayette County Deed Record Y2:220). Then in 1914 after Mildred A. Sentell died, her heirs sold all of the Sentell property in Lafayette County, including that known as the Barnett Plantation to M. D. and Roy Lester (Lafayette County Deed Record Y3:501-502).

According to Betty Nutt of Lewisville, granddaughter of M. D. Lester, the land was used for farming cotton and running cattle. During floods, it was sometimes necessary to bring the cattle into town and following the 1927 flood it was several years before the land could be worked. After M. D. Lester died, the land went to his six surviving children. Members of the family managed the property until 10 or 15 years ago when they began leasing out the land (Nutt 1980). W. H. Triplett owned the property surrounding 3LA97 at the time of the archeological investigation. He leased the land for crops and cattle raising.

THE CEDAR GROVE CHURCH AND COMMUNITY

The nucleus of the Black community that formed in the area of the Cedar Grove site, 3LA97, after the Civil War came from F. W. Armor's slaves and the freedmen who contracted to work the Sentell property in 1865 (Lafayette County Will Record B:212-213; Sentell 1865). There is no obvious tie to the slaves that Higgs and McClintock purchased from Barnett, suggesting that these slaves were probably moved from the property before it was sold to Armor and Sentell (Lafayette County Deed Record F:185, 358-359). In 1870 the population of LaGrange Township, which included the Cedar Grove community, was 2,784--1,936 Black (70%) and 848 White (30%) (U.S. Census 1870:Lafayette County). By 1900 the population of the area, now in Steele Township (a portion of the earlier LaGrange Township), had grown to 854--741 Black (87%) and 113 White (13%) (U.S. Census 1900; Lafayette County).

The Cedar Grove Baptist Church was, and is, an important part of the community. Established in 1881 by Cage Bryant, who was the congregation's first pastor, the original church was a log building at 3LA97 (Foster 1980; Sasser 1980). This is probably the "residence" shown at that location on an 1887 map (see Figure 2-2)(U.S. Army Corps of Engineers 1892:sheet 6). According to Emma Davis, a member of the church, this building burned in 1924 (Davis 1980). It was probably at this time that the church was moved to its present site, because a map of the Lester property drawn in 1925 (Figure 2-3) does not show the church (Christian 1925). The church suffered a second fire in 1931, which destroyed all of its records, and the present building was constructed in 1933 (Cullins 1980; Sasser 1980).

Social life in the community centered around the church and, in the early part of this century, around a lodge called the Royal Circle. The organization of groups which provided burial insurance as well as fraternal associations was a common practice in Black society of this period. These lodges gave the Black community a measure of independence and stability at a time when segregation had been legalized and racially motivated violence was high.

The Supreme Royal Circle of Friends of the World was a fraternal and benevolent society organized at Helena, Arkansas in 1909 by Dr. R. A. Williams. By 1918 it had 25,000 members in five states and was especially strong in the Red River Valley, possibly because W. T. Daniels, the Supreme Secretary, lived in Texarkana (Work 1919:460). According to church members who remember the Royal Circle, it cost \$5 to join and then the dues were \$1 every two months. The Circle had separate organizations for men, women, and children which had meetings and socials, and the children got special buttons to wear. As a benevolent society, the Circle paid hospital bills and burial expenses (McGlothlin 1980; Foster 1980; Davis 1980).

There was also a school in the Cedar Grove community. The date it was begun is not known, but by 1908 according to Johnny Foster the school was held in the church and met three months in summer and three months in winter (Foster 1980). By 1931 the Cedar Grove School was part of the Lewisville District, serving 66 children in grades 1-6 during an 80-day

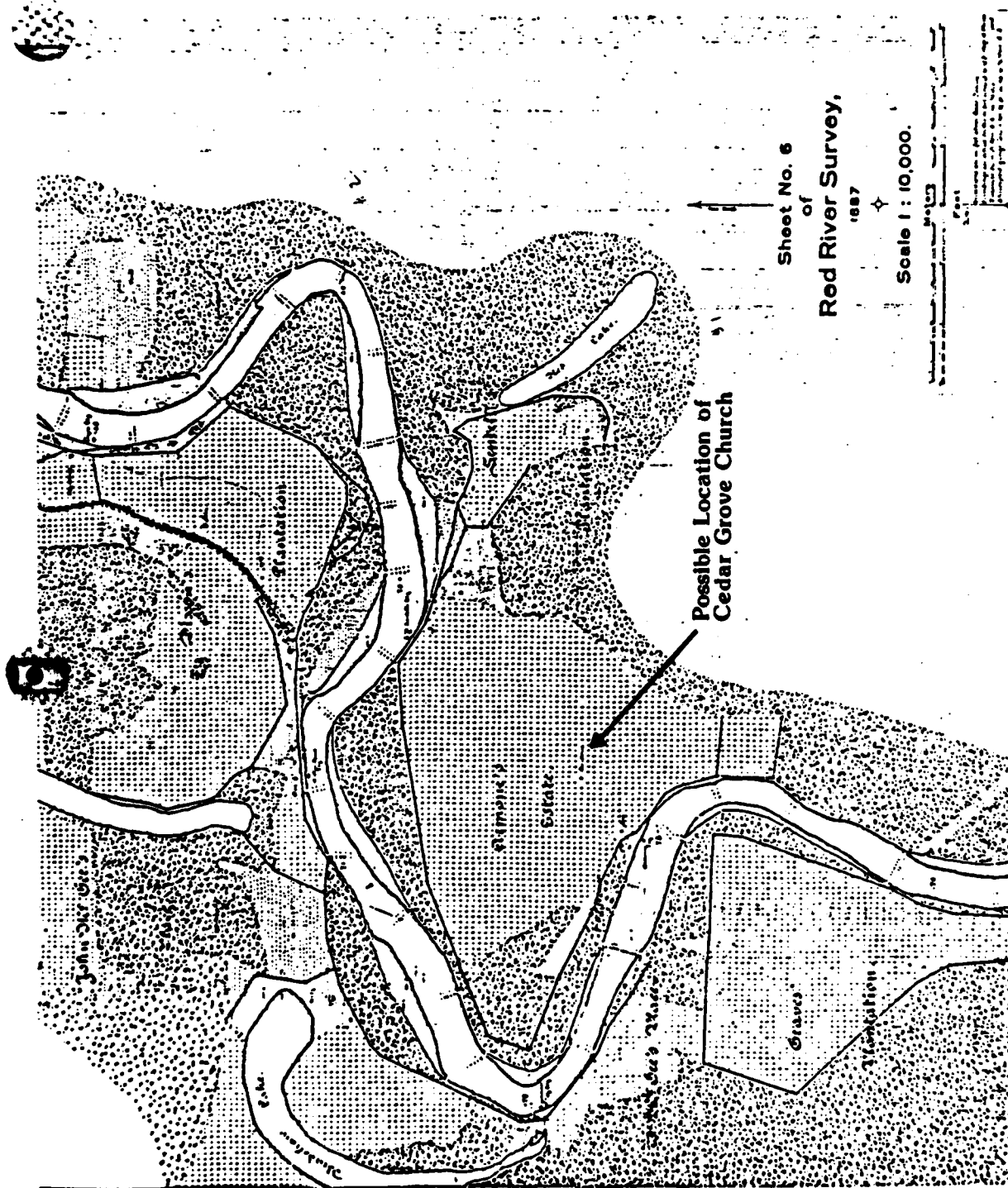


Figure 2-2. The Cedar Grove vicinity in 1887 (from U.S. Army Corps of Engineers 1892)

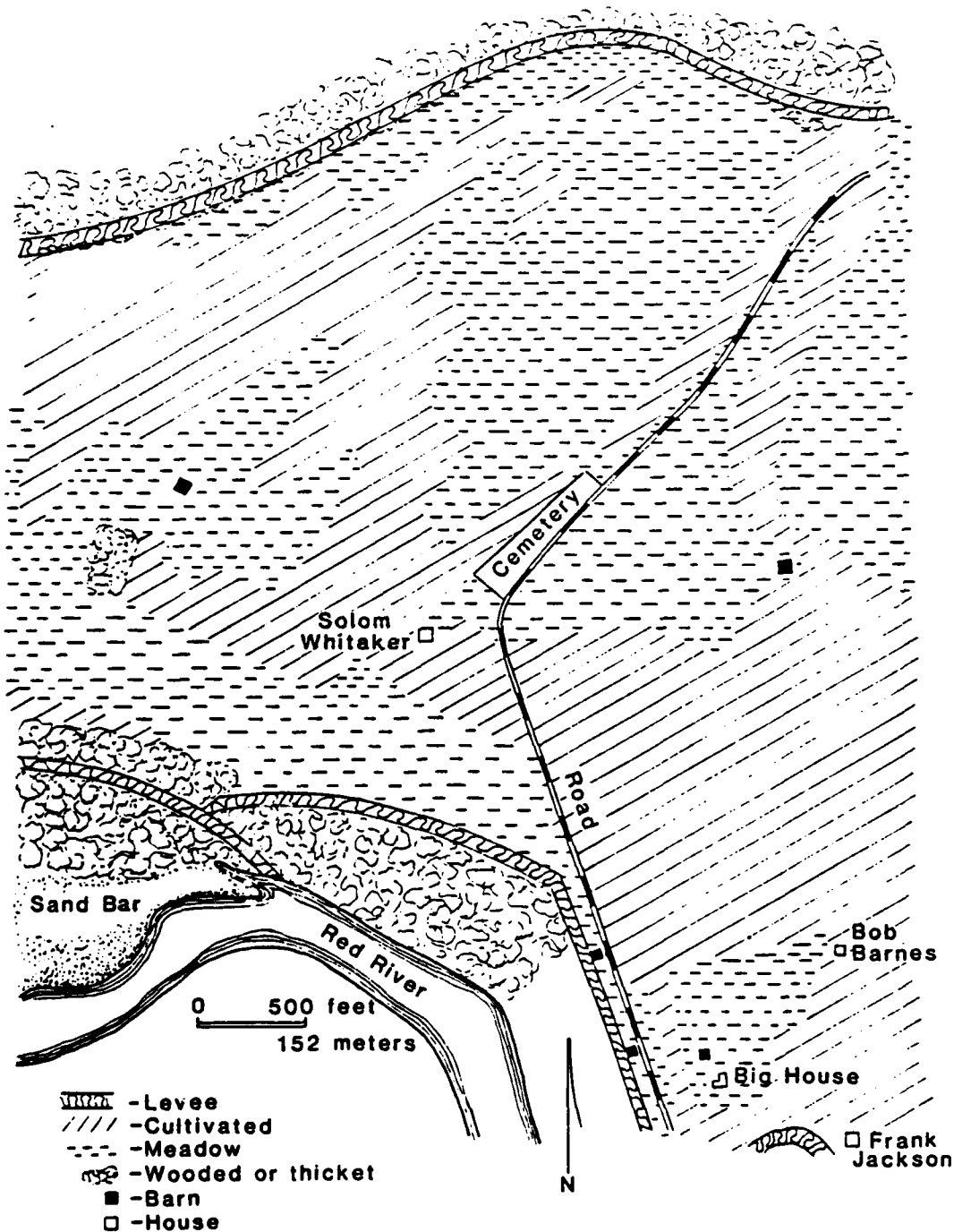


Figure 2-3. Lester Brothers property surrounding the Cedar Grove Cemetery in 1925 (after Christian 1925)

winter term. It is not clear whether there was a separate school building or whether the school still met in the church. By 1948 the school had its own building next to the church and served 80 children in grades 1-8 during a 160-day term (Lafayette County Supervisor of Schools 1931, 1948)

THE CEMETERY AT CEDAR GROVE

The cemetery was on the west side of a wagon road in 1925 and may have been fenced to keep livestock out. There is conflicting information regarding a cemetery fence. Peter Cullins remembered that there had been a fence to keep cattle out. Johnny Foster remembered a field fence, but not one for the cemetery; his sister's grave had a wire fence, but it was the only one there. Thus it is possible that the cemetery was separated from the surrounding fields on its north, west, and south sides by a cattle fence, but was open to the road on the east. Individual grave fences, such as the one Foster remembered, were often used in turn-of-the-century graveyards, although they were usually made of cast iron. The 1925 map shows it to be 182-200 m along the road and from 15-30 m wide (Christian 1925) (see Figure 2-3).

It is not possible to determine when the first person was buried in the cemetery at 3LA97. The church records were lost in the fires and even the oldest church members do not know whether the cemetery was there before the church was built, or whether the cemetery was started after the church was established. Given the number of graves--112 in the direct impact zone, 13 in the test area south of the construction road, plus an unknown number under the road and to the south and west of the tested areas--several factors suggest that the cemetery was established before the Civil War, possibly as early as the late 1830s.

Certainly slaves died on the Barnett Plantation and were buried somewhere on the property. A cemetery would not have been located on prime agricultural land, and this one is on the river side of an early levee. Many slaves insisted that graves be oriented east-west (as these are) with the head to the west so the deceased would not need to turn around "when Gabriel blows his trumpet in the eastern sunrise" (Genovese 1974:198). It would naturally follow that the freedmen's community would build its church at an established cemetery and would continue to bury there because the land was already set aside for that purpose, and/or because they had relatives buried there. It can, of course, be argued that Sentell allowed the community to build its church at this site and that the cemetery grew alongside the church. But by 1887 this location was in the center of a large field, prime land well inside the levee, and not land that could be easily taken out of production (U.S. Army Corps of Engineers 1892:Sheet 6).

Speculative statistics also support an early date for the cemetery. If there are 200 graves in the cemetery (a conservative estimate since there are up to 125 known graves and a large area of the cemetery has not been investigated) and if the cemetery was in use from 1834, when the Barnett Plantation was established, until 1927, when it was covered by silt from the flood, then the average number of burials per year was 2.2. In

1850 the annual mortality rate for slaves in Arkansas was 1.8 per 100 (Taylor 1958:158); in 1900 the rate for blacks nationwide was 2.5 per 100, dropping to 1.6 per 100 in 1930 (U.S. Census 1971:55). The slave population on the Barnett Plantation grew from 65 in 1850 to 137 in 1860; there were about 80 freedmen on the Armor and Sentell places in 1865; no exact figures are available for later dates, but judging by the school population, the community was probably stable at 100-125 people. This would put the burial rate in line with the mortality rates. On the other hand, if there are 200 graves and the cemetery was started at the same time as the church (1881) the burial rate would 4.3 per year, well above the mortality rate for a population of this size.

THE PEOPLE AT CEDAR GROVE

Because of the number of unmarked graves in the cemetery an effort has been made to compile a list of the persons known to be buried there. Peter Cullins, a deacon and the eldest member of the Cedar Grove Church, and other church members including Johnny Foster, Sophie McGlothin, and Emma Davis provided a list of names of the people they know to be buried there. These names were then checked in census and other records to determine birth dates and family associations. The list includes 35 people buried at Cedar Grove; because of the ages of the informants, it is unlikely any of these died before about 1910. Still, of the 37 people on the list 16 were born before 1865 and therefore began life as slaves. In the list, which follows, all information is from the 1900 census (Lafayette County, Steele Township) unless otherwise indicated (*s mark those in the cemetery).

*Felix Brown: born October 1868 in Arkansas; both parents also born in Arkansas. In 1893 married Rachel, who was born in Arkansas in 1870 also of Arkansas parents; their children include Carrie (1894), Edna (1897), and Singum (1899).

*Cage Bryant: born July 1848 in either North Carolina (U.S. Census 1870) or Virginia; both parents born in Virginia. Listed in F. W. Armor's will (Lafayette County Will Record B:212-213). First wife Celia born in Kentucky in 1845, their children: Jonas (1868) and Creasy (1870) (U.S. Census 1870). Married a second time in 1888 to Mary, born in Arkansas in 1865; her father was born in Arkansas and her mother in Virginia; their children: Bettie (1892), John (1895), Louisa (1897), Modicue (1899). Also two other children, probably by Celia: Amilie (1884) and Buzzy (1887). Bryant was the first minister of the Cedar Grove Church and cut the logs for the church building (Cullins 1980).

*William S. Campbell: born October 1854 in Louisiana; both parents were born in Alabama. In 1886 married *Sarah, who was born in Arkansas in 1865; their children include Ella (1889), Thomas (1890), Rosa (1893), Annie (1895), and Robert (1899).

*George Clark: born December 1849 in Arkansas; both parents also born in Arkansas. In 1880 married *Little (Liddie), who was born in 1847 in Mississippi whose father was from Georgia and whose mother was from Alabama. They had seven children, but by 1900 all of the children had left home.

*King Clark: born December 1865 in Arkansas; both parents also from Arkansas. In 1890 married *Queen, who was born in Arkansas in 1872 to Arkansas parents. Their children include Susie (1890), Bertha (1892), Moses (1895).

*Torrance Clark: born November 1875 in Arkansas; both parents also from Arkansas. In 1896 married Mary, who was born in Arkansas in 1865 to Arkansas parents. In 1900 two stepchildren lived with them: Joshua Lawless (1889), and Lettie Richardson (1892).

*George Collins, Sr.: born January 1857 in Arkansas; both parents also from Arkansas. In 1877 married *Amanda, who was born in Texas in 1861. Their children include Dorcas (1880), Rose (1882), Ella (1884), Malissa (1886), Mattie (1889), George (1892), Lonnie (1894), McKinley (1896), and Pink (1899).

*Alex Conner: born in Louisiana in January 1854; both parents also born in Louisiana. In 1885 married Lou, who was born in Louisiana in 1865 to Louisiana parents. Their children include Paralie (1886), *Della (1888), Joseph (1892), and Willie (1894).

*Walter Conway: born July 1872 in Arkansas; both parents from Arkansas. In 1892 married *Lela, who was born in Arkansas in 1876 to Arkansas parents. Their children include Sam (1893), Tarsus (1896), and an unnamed infant (1899).

*Mitchell Foster: born March 1868 in Arkansas, the son of Henry Foster (born 1840 in Mississippi) and Fanny (born 1840 in Virginia) (U.S. Census 1870); died just before the 1927 flood (Foster 1980). In 1883 married Adeline, born 1863 in Arkansas and probably listed in Armor's will (Lafayette County Will Record B:212-213). Their children include Josephine (1887) and Lula (1889). Married a second time to *Mamie Reece, daughter of Peter and Calvena Reece. Children include Johnny (1903) and a *daughter whose nickname was Little Bit (Foster 1980). Mamie Foster died in 1915 (Foster 1980).

*Horace Jackson: born June 1865 in Arkansas; both parents born in Virginia, son of Mary, born 1833 (Lafayette County Will Record B.212-213). Had a son Frank (1887) by his first wife; married a second time to *Mollie, born in 1866 in Louisiana of parents also born in Louisiana. Jackson died September 1, 1918 and had a Royal Circle headstone which was recovered after it had fallen into the river due to erosion (Figure 2-5).

*Travis Lewis: born in Texas in 1859; both parents from Mississippi. In 1885 married *Nancy, who was born in Arkansas in 1863, whose father was

born in North Carolina and whose mother was born in Mississippi. Their children include Travis (1886), Eliza (1889), Queen E. (1890), William (1892), Betsy and Cornelia (1894), Alma and Josephas (1896), Isaac (1897), and an unnamed infant (1899). In 1900 Lewis owned his own farm, although it was mortgaged (Lafayette County Real Estate Tax Records 1900).

Moses McGee: born in Louisiana in June 1855; his mother was born in Mississippi. In 1888 he married Viola, who was born in Arkansas in 1870 to Arkansas parents. In 1900 they had no children.

*Antony Mitchell: born March 1853 in Mississippi; both parents also born in Mississippi. In 1878 married *Catherine, born in 1850 in Louisiana of parents also born in Louisiana. Their children include: Mack (1882), Colonus (1884), Torrey (1886), Maude (1888), Carrie (1889), Kizer (1893), and Ninette (1895). Married a second time to *Mary who died November 23, 1925 and had a Royal Circle headstone which was recovered in the June 1980 testing (Figure 2-6).

*Lue Powell: a recovered tombstone dated September 4, 1919 gives her age as 64 (Figure 2-7) which would be a birthdate of 1855. No listing was found in the census for a person of that name with that birthdate. The closest listing was for a Louisa Powell, born January 1848 in Arkansas. All of the informants agree, however, that Lue Powell was the mother of Grammous (1875) and that her *husband was also buried at Cedar Grove.

*Peter Reece: born January 1850 in Alabama, both parents also born in Alabama. In 1870 lived in the Joseph Herndon household along with Mella Reece (17) and Diana Reece (14), probably his sisters (U.S. Census 1870). In 1871 married *Calvena, born in Arkansas in 1852; their children: *Peter J. (1882), *Mamie (1884), John (1886), Willie (1888), Alice (1890), Man (1892), and Dock (1896). In 1900 Reece was one of the few blacks to own his own farm (Lafayette County Real Estate Tax Records 1900). Peter and Calvena Reece were Johnny Foster's grandparents (Foster 1980; Cullins 1980).

*Jeff Davis Richards: born December 1863 in Arkansas; son of David Richards (born January 1842 in Missouri) and Lottie Richards (born 1840 in Indian Territory). The family is listed on the contract between Sentell and the freedmen (Sentell 1865). In 1885 Richards married Ella, who was born in Arkansas in 1866 to Arkansas parents; their children include Mary (1885), *Sy (1886), John (1892), Willie (1893), and Conder (1898). The recovered Royal Circle tombstone dated May 24, 1917 and labeled J. B. Richard (Figure 2-8) probably belongs to Jeff Davis Richards, because none of the informants remembered anyone with the initials J. B. *William, Jeff Richards' brother, was also buried at Cedar Grove (Cullins 1980).

*Allen Wilkerson: born March 1872 in Arkansas; son of Allen Wilkerson born in Georgia in 1822 (U.S. Census 1870). In 1892 married *Siely, who was born in Arkansas in 1875 to Arkansas parents, their children include: Lettie (1892), and *Minnie, who died in 1915 and had a Royal Circle headstone (Cullins 1980) which was recovered during the original site investigations 1980 (Figure 2-9).

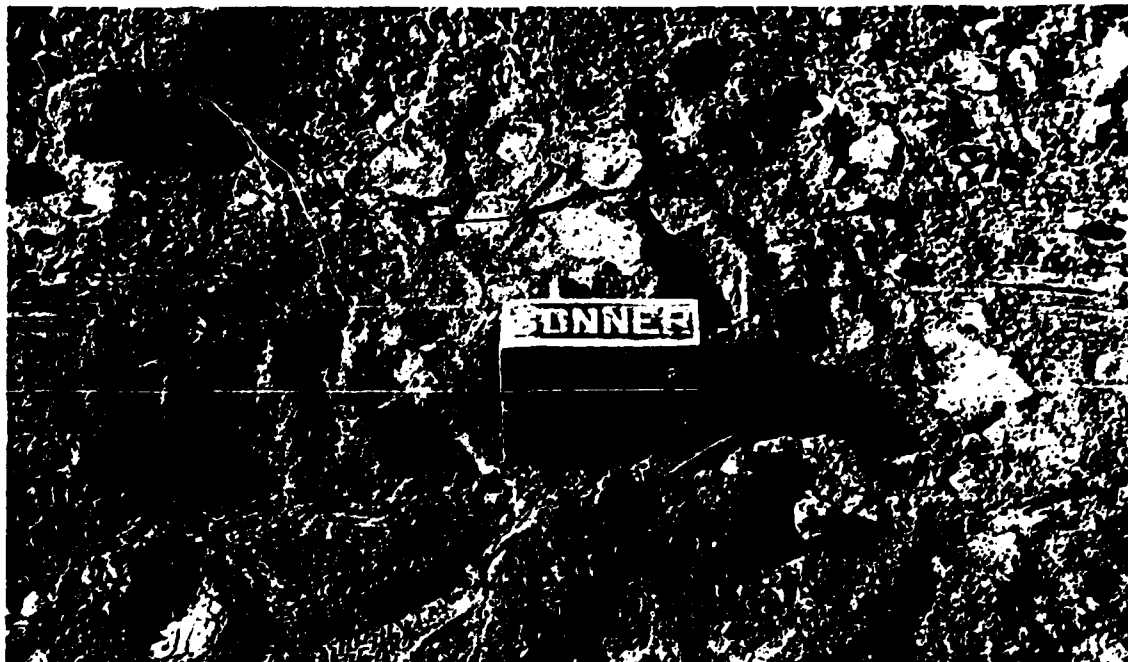


Figure 2-4. In situ footstone after stripping direct impact zone,
October 1980 (AAS 807585)

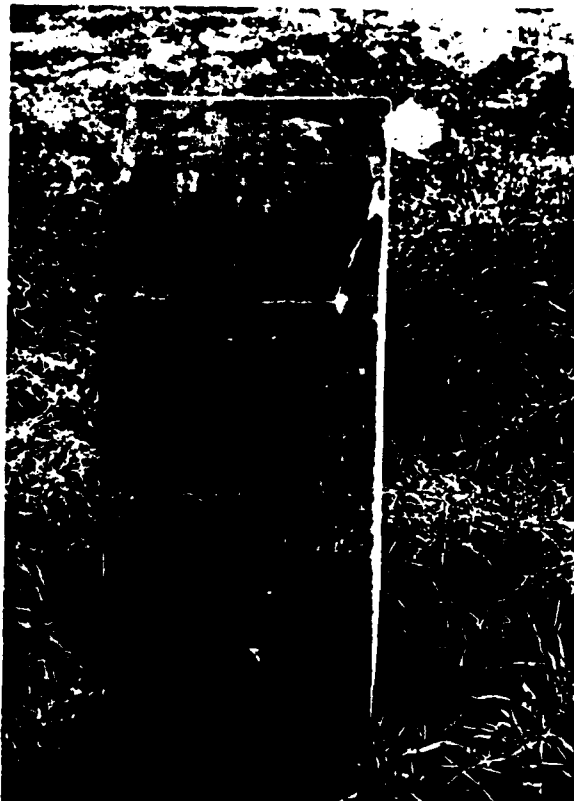


Figure 2-5. Relocated tombstone of
H. J. Jackson (AAS 808222)

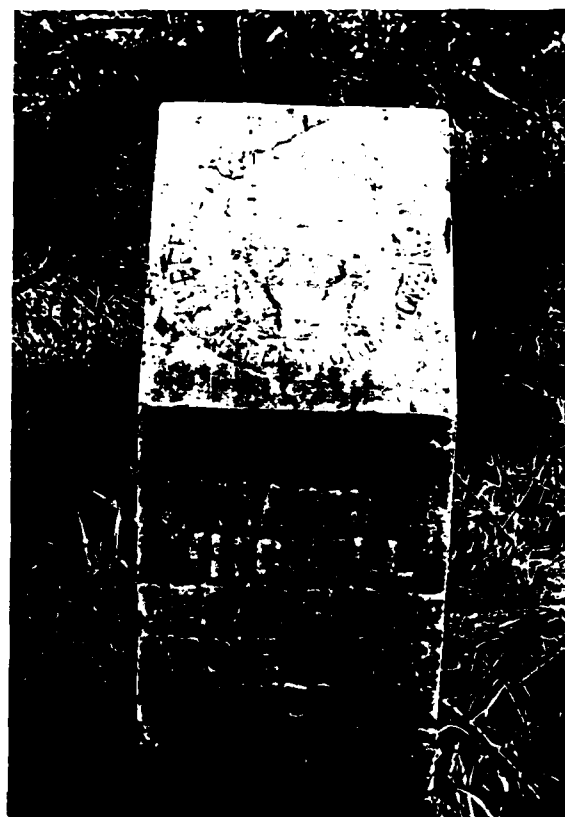


Figure 2-6. Relocated tombstone of
Mary Mitchell (AAS 808222)

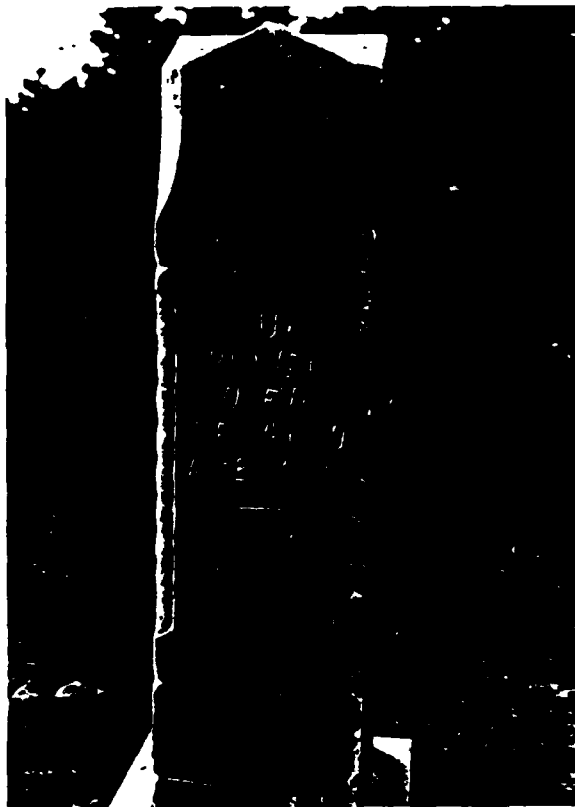


Figure 2-7. Relocated tombstone of
Lue Powell (AAS 808216)

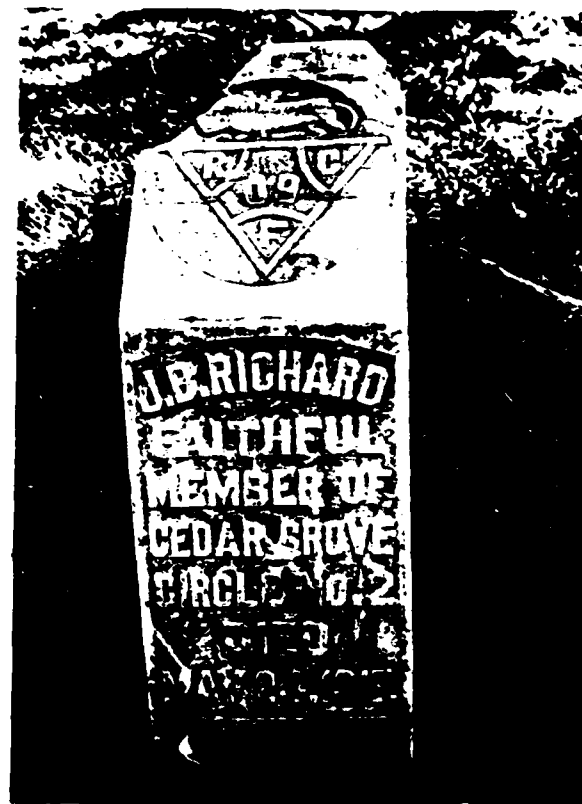


Figure 2-8. Relocated tombstone of
Jeff Davis Richards
(AAS 803845)

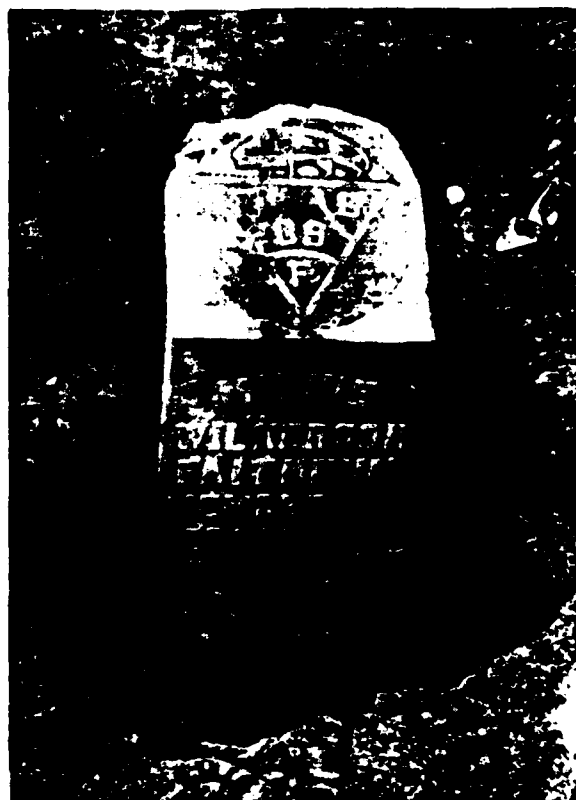


Figure 2-9. In situ tombstone of Minnie Wilkerson, after initial site discovery, June 1980 (AAS 803845)

Chapter 3

ARCHEOLOGICAL BACKGROUND FROM 1980 EXCAVATIONS

by Neal L. Trubowitz

Both archeological features and artifacts recovered during the 1980 excavations confirmed the basic documentary and oral evidence of the nature of the site use in the nineteenth and twentieth centuries before it was buried. A cemetery lay on the west side of a dirt road, on whose opposite side cultivated fields had stood. Between the roadbed and cemetery was an older levee.

FEATURES

Feature numbers were assigned in order of their discovery, and as the west muck ditch of the historic levee had been found first during the June testing, it was designated as Feature 1. The overall levee was designated Feature 2, with the east muck ditch as Feature 22 and the historic road numbered Feature 23. Historic burials were numbered individually in a separate series (HB 1-128). The final count identified 125 historic graves.

The Levee

The levee appears to be the oldest historic feature on the site, as shown by the presence of road ruts on its eastern flank, and the intrusion of the most easterly rows of historic graves on its western flank (Historic Burials 11, 22-23, 29 and 39-45 all clearly cut into the levee).

The Roadbed

Feature 23 first appeared in the profile of some of the 3 m squares dug (354 E184 and S57 E184) and then again in Backhoe Trenches 1 and 2. It showed as thin narrow ruts in floor plan in column sample S75 E181 and during the final stripping of the site overburden it appeared as a hardpacked layer running across the site, parallel to the historic levee at an angle of 42° east of north. This corresponds exactly with the orientation of the roadbed shown in the 1925 map of the area (Figure 2-3); there is no doubt that the map road and the archeological feature are one and the same.

The Cultivated Field

East of the roadbed floor plan, plow scars and undulating profiles in both 3 m square excavation units and Backhoe Trench 1 showed that the area had been cultivated before its burial by the 1927 flood; again these data agreed with the 1925 map of the area. In floor plan the plow scars trended from southwest to northeast, once again paralleling the historic roadbed and levee.

The Historic Cemetery

During the testing phase of the research at Cedar Grove no evidence of historic graves outside of the north end of the direct impact zone was recognized. At that time the construction had revealed the tombstones of Mary Mitchell (HB 9), Lue Powell (HB 8), J. D. Richards (HB 7) (probably mislabeled J. B. Richard), and Minnie Wilkerson (HB 6), in addition to the stone of H. J. Jackson, which had fallen into the river due to erosion. During testing five grave shafts of unidentified individuals were located in addition to the four marked graves, bringing the total to nine graves found. What later turned out to be Historic Burials 116 and 119 were seen in the indirect impact zone when the east-west trench was opened, but they were then considered to be potential aboriginal graves.

Between the testing and excavation phases of research the Red River Levee Board and the Cedar Grove Church sought to remove the identified graves for reburial in other local cemeteries. The four marked graves were moved with no identification problems, but it is not clear whether they accurately removed the graves identified as Historic Burials 1 through 5. It is certain that at least one burial (probably HB 1) was removed at the location of Historic Burials 1 and 2 (Figure 3-1), but later superimposition of the maps from the testing and excavation research shows that what was labeled as Historic Burial 78 after the final site stripping could have been the same grave as Historic Burial 2, indicating that it had not been removed. Similarly at least one grave (probably HB 5) was removed near Test Unit 5 where Historic Burials 3, 4, and 5 had been identified. Again superimposition of maps showed that HB 3 might be the same as HB 30, and HB 4 might be the same as HB 73. At most the grave removal took the four graves that were marked, one burial near Test Unit 5, and possibly two burials near Test Unit 2.

This coincidence of some of the graves was not noted until after the excavations were completed in the winter of 1980. During data recovery historic graves were numbered in order of their discovery as they were revealed in the backhoe trenches and small excavations (Historic Burials 11-27). This was after the first overburden stripping had revealed the fifth and final marked grave, that of a member of the Conner family, which was numbered as HB10. After the final stripping revealed rows of historic graves in the direct impact zone, they were numbered roughly in those rows which ran southwest to northeast, from the east side of the cemetery to the west (Historic Burials 28 to 115). The final burials (HB 116-128 were

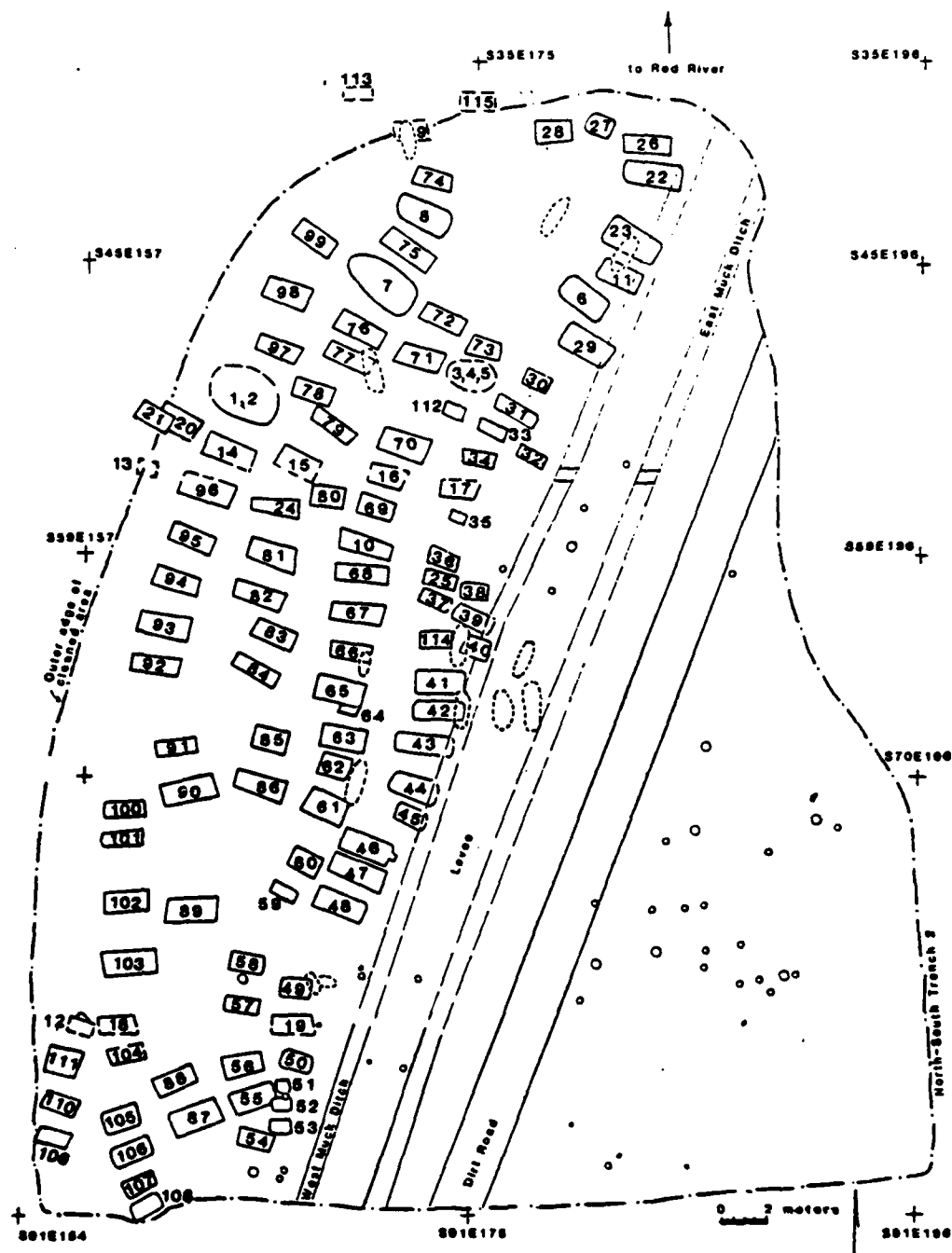


Figure 3-1. Historic burials in the direct impact zone. The dashed outlines indicate prehistoric burials.

identified during the hand excavations in the indirect impact zone. Between the work in Backhoe Trench 2 and the final site stripping there may have been a misidentification making HB 14 and 21 one and the same grave. Considering this possible overlap and those already noted, the actual number of historic graves identified in the ground represented no less than 124 and no more than 126 people. Thirteen of these graves were in the indirect impact zone and the rest were in the direct impact zone.

The historic grave shafts appeared against the surrounding soil surface as rectangular or square features with a mottled light colored fill. In profile they appeared as vertical shafts. Probing showed that the graves were oriented with the head at the west end of the grave, facing towards the levee and road to the east. Although the stripping made it impossible to exactly determine the original depths to which the grave shafts were dug, they appeared to go about 2 m below the surface for adult burials, with smaller children having shallower graves. The horizontal dimensions of the grave shafts varied between minimum and maximum lengths of .9 to 2.6 m and minimum and maximum widths of .5 to 1.2 m. The mean or average length and width was 1.86 x .9 m (6.1 x 1.67 ft.). The ratio of the length/width measurements was calculable for 101 of the graves, giving a range between .91 and 3.57, with the average or mean length/width ratio at 2.12; this showed that the grave shafts tended to be rectangular, averaging just over twice as long as broad.

Based on the low number of graves found during the June 1980 testing, and their coincidence with the majority of the marked historic burials, the discovery of over a hundred more during the data recovery must rank as the biggest surprise of the 1980 excavations, although their broad extent became apparent as soon as the backhoe trenches had been completed, hitting graves across the north-south expanse of the direct impact zone. They were also recognized immediately on the reopening of the indirect impact zone excavations. The historical records search in local repositories was begun by historian Beverly Watkins while the prehistoric component data recovery was underway, and it was then that she recognized and recorded the large cemetery area on the 1925 map of the site (Figure 2-3) in the possession of the landowner, Mr. Triplett. It was readily apparent that the documentary and archeological evidence corresponded in the orientation of the cemetery adjacent to a local dirt road.

The map dimensions showed the length of the cemetery to have been between ca 182-200 m along the road, with the width varying from a narrow ca 15 m at the north end to ca 30 m at the south end. In the direct impact zone excavations the width of the cemetery came to about 16 m within the area stripped for investigation of the aboriginal component. The indirect impact zone excavations opened a smaller area that showed historic burials running east to west across at least a 13 m wide expanse.

Further delineation of the historic cemetery was not sought beyond that revealed in the field investigations of the aboriginal component, as that was outside the Scope of Services for the 1980 project. Our immediate responsibility to any historic graves that we encountered was to mark and

map them, leaving them undisturbed, so far as they did not preclude investigation of the Caddo occupation. Removal of the historic graves was specifically not part of the contract for the aboriginal data recovery between the Corps and the Survey.

The historic graves were obviously oriented in rough rows parallel to the roadbed, although these rows sometimes seemed to blend or split apart (Figure 3-2). In the direct impact zone there were at least four major rows (numbers 1A/1B, 3, 4B, and 5A) with several smaller rows or single graves between larger rows (numbers 2, 4A, 4C, 5B, and 6). The larger rows had no fewer than 15 graves, while the most any of the smaller rows could be seen to have was six graves (row 6). In the indirect impact zone there was evidence indicating as many as six possible rows, but there was not enough area exposed there to reveal more than three graves in any single row, or to match them with any assurance to those found in the direct impact zone.

Some speculation is possible concerning the total size of the cemetery population, even though its total dimensions have not been ascertained in the field. It seems likely that the newest part of the cemetery was at the north end, where the few marked graves were recovered. The progression of these graves in rows 4B and 5A may indicate this also, with the most recent date of death for Mary Mitchell (November 23, 1925) being the most northerly of the identified graves, followed by Lue Powell (September 4, 1919) and J. D. Richards (May 24, 1917) farther south in the next row over (Figure 3-2). Furthermore, there was an unused space between rows 1A/1B and row 4B that may have been left for future burials. If the cemetery had extended much farther to the north, it would seem likely that more than the Jackson tombstone would have been eroded away by the river while the construction crews were in the area. Local avocationalists Herschel and Dot Kitchens take regular boat trips along this portion of the Red River to inspect the sandbars and bank lines for eroding archeological remains, and they had not encountered skeletons or gravestones in their trips before the discovery of 3LA97 during the revetment construction. Thus, it is concluded that the graves found at the north end of the site probably correspond well with the northern limits of the historic cemetery at 3LA97, and the major portion of it still exists.

If the 1925 map is assumed to be an accurate picture of the dimensions of the cemetery, a conservative estimate of the area, using a 182 m length by 15 m width gives an area of about 2,787 m². An estimate of the average density of 1 grave for every 10 m² was obtained for the site by overlaying eight 10 m squares on the map of the burials in the direct impact zone, starting south of the newer part of the cemetery at the north end, which was not filled with its total capacity for graves. Counts were made for each of these eight squares, and the average number of burials was calculated at 10.5 burials per 100 m², which was then converted to the ratio of 1 grave for every 10 m². By dividing the total estimated cemetery area by this figure an estimate of 279 total burials is obtained for the entire cemetery.

Using the same ratio it was calculated that there should be about 64

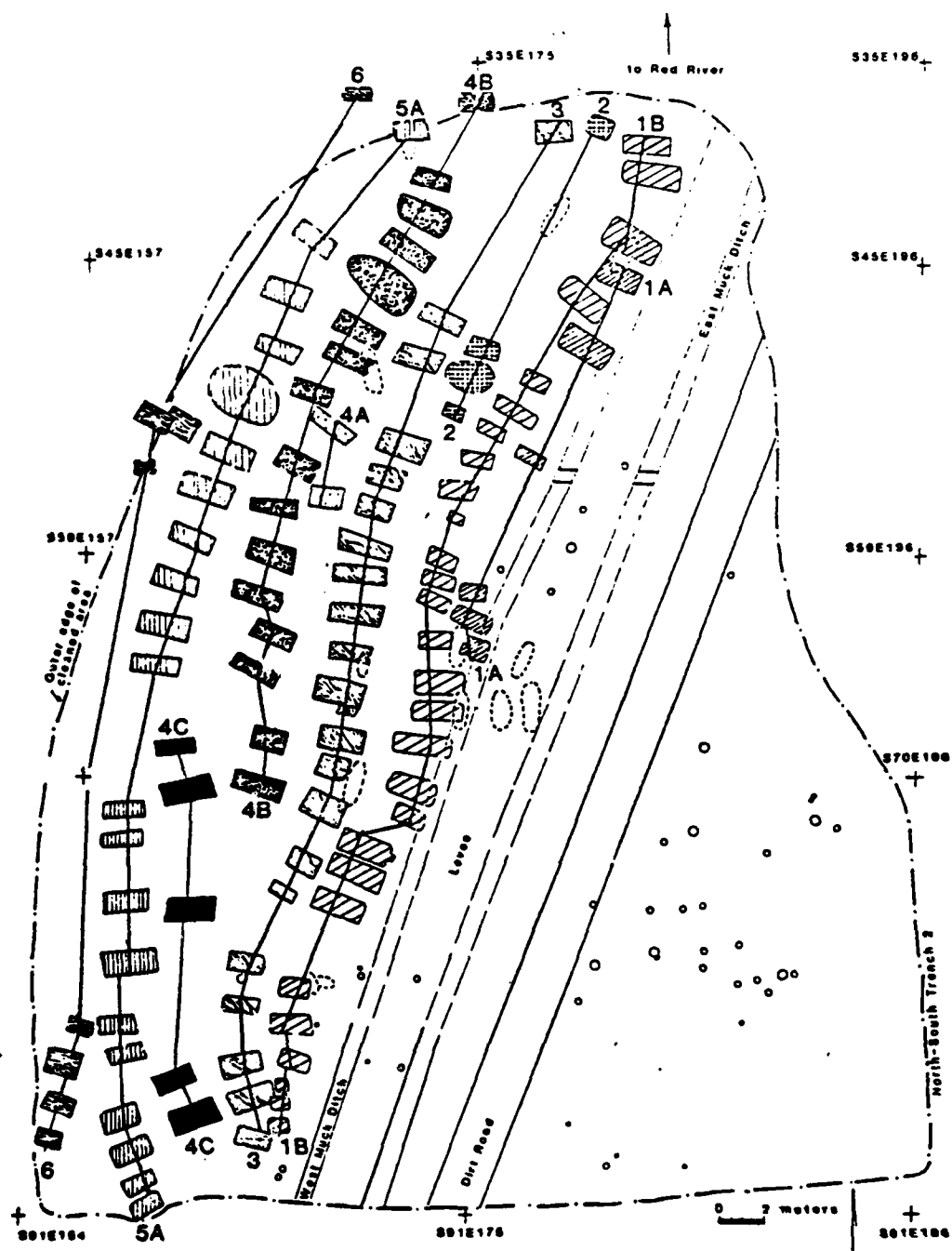


Figure 3-2. Historic grave rows in the direct impact zone

burials in the area between the excavations in the indirect impact zone and the direct impact zone, 80 more burials to the south of the indirect impact zone and about nine undiscovered graves near those same excavations.

If the cemetery was started as early as 1834, during the first American settlement of the property, and its known termination of use is the 1927 flood, then the cemetery's maximum usage spans 93 years. Dividing the total number of projected burials by this time span gives an average mortality rate of 3.0 per year, which is slightly higher than figures projected by Watkins (Chapter 2). However, to shorten the time span of usage of the cemetery would greatly increase the mortality rate estimate. The local Black population of the site area, both slave and free, has rarely exceeded 200 persons. Therefore, it is concluded that the Cedar Grove Cemetery is one of the first Black cemeteries to have been established in this area, and it should date to the pre-Civil War era. It is the largest of any of the Black cemeteries in the vicinity.

Cemetery Distribution in the Cedar Grove Vicinity

The Cedar Grove Cemetery location is like the other cemeteries still in use by the Cedar Grove Church. The cemeteries are all located on donated land that was marginal to agricultural practices current at the time of their establishment. The Wright Cemetery lies on the filled in oxbow of the north end of Battle Lake. The other two cemetery locations are on the filled in portion of the north end of the Mays Lake oxbow and the edge of the oxbow on the lake's opposite end, closest to the Cedar Grove Church. The church is central to these burial locations, which may represent the immediate dispersed church cemetery limits. The Wright Cemetery is about 4 km by road from the church, while the Cedar Grove Cemetery lies just under that distance in the opposite direction.

MATERIAL REMAINS AND HISTORIC ARTIFACTS

Although prehistorians often have no choice but to group their artifacts according to raw materials, working with historical debris has the advantage that many of the artifacts are of known use. At Cedar Grove identifiable items were found among the metal, glass, ceramic, and synthetic materials that were recovered and, of course, the tombstones. Besides those materials that were identified there were 73 objects which could not be identified by visual inspection, and another five items that were of synthetic origins, but again could not be identified visually. Metal was the most common historic material found (410 items), followed by glass (136 pieces) and ceramics (only 16 artifacts). Identifications and dates were assigned by Neal Trubowitz in consultation with Leslie Stewart-Abernathy. The historic materials indicate a nineteenth to early twentieth century occupation connected with the Cedar Grove Cemetery, levee, roadbed, and cultivation. All the material remains and artifacts discussed in this chapter were recovered from the levee, muck ditches, and

original ground surface and disturbances during the mitigation of the prehistoric component (see Trubowitz 1983 for details). Materials recovered during the mitigation of the historic cemetery are described in Chapter 5.

Tombstones

The few tombstones that were found at Cedar Grove have been relocated at the Old Town Cemetery north of Lewisville in Lafayette County (Lue Powell) or the Cedar Grove Cemetery along Mays Lake on the Doyle Smith place (Jackson, Mitchell, and Richard). No analysis of the tombstone materials has been made, but they were either granite or marble. Four of the stones were rectangular blocks with a beveled top face displaying the seal of the Supreme Royal Circle of Friends (Jackson, Mitchell, Richard, and Wilkerson, Figures 2-5, 2-6, 2-8 and 2-9). This design consists of a lion above an inverted triangle with the initials R., C., F., (Royal Circle of Friends) in the angles surrounding a central "09" that probably stands for a 1909 founding date for the society; these designs are present at other Society cemeteries (Beverly Watkins, personal communication). Mary Mitchell's stone has in addition the inscription "Supreme Circle of Friends of the World" surrounding the lion/triangle device. On the face of the stones the Chapter number (Circle No. 2) and name (Cedar Grove) are given in addition to the name of the person and date of death.

Unfortunately most of the graves were unmarked, or else they had originally been identified with wooden or other markers which have since deteriorated. However, no postmold or board stains were noted at the head of the burials without markers. The preponderance of unmarked graves may be typical as this was the case at the Wright Cemetery, one of the three extant Cedar Grove community burial grounds. There unmarked sunken pits show the locations of graves outnumbering those with an assortment of tombstones (Figure 3-3). The tombstones range from carved shafts like those found at Cedar Grove, to poured concrete in which the burial information has been inscribed (Figure 3-4).

This pattern of unmarked graves in the majority of cases, with a few concrete markers being replaced by stone shafts after the turn of the century is probably common in Black cemeteries across the lowland areas of Arkansas. The pattern was found for the Black community at Parkin in Cross County, Arkansas (Stewart-Abernathy, personal communication). These views of the Wright Cemetery present a time capsule view of how Cedar Grove must have looked before its burial by the 1927 flood. At the time of our visit to the Wright Cemetery (December 21, 1980), some of the brush had just been cleared away by burning, and a new grave had been recently dug. Some of the stones there are contemporary with those at Cedar Grove.

Lue Fowell had a different headstone, a rectangular block that had been decorated and trimmed to resemble a column design surmounted with an arched cap of fallen leaves (Figure 2-7). Besides name and date of death, the age (64 years) was given, plus the inscription "Gone to a better land."

Footstones were also in use at Cedar Grove. One was found for Mary Mitchell (Schambach et al. 1982), and the only stone found with the Conner burial (Figure 2-4) was probably also a footstone. Evidence for a missing



Figure 3-3. Unmarked sunken grave pits at the Wright Cemetery, Lafayette County, Arkansas (AAS 815687)



Figure 3-4. Variety of marked graves at the Wright Cemetery, Lafayette County, Arkansas (AAS 815681)

footstone--a square projection of the grave pit-- was found at Historic Burial 46 (Figure 3-1).

Metal

Almost half of the metal recovered was rusted iron which could not be identified. The majority of the recognizable metal artifacts were also iron, with two coins (see below), 10 pieces of brass, (8 ammunition, 1 button, and 1 tack) and seven pieces of lead (5 ammunition, 1 decorative coffin plate and 1 bale seal) as exceptions. The bale seal was 18 mm (.7 inch) in diameter and had an inscription reading "RMECO." It was found in Levee Transect Unit 11. The lead coffin piece from Historic Burial 13 was a decorative molding around a fastener.

Iron Fasteners and Fencing

Nails and other fasteners were the most common metal artifact found. A total of 93 nails were found, all but two of which were wire nails, which would place their manufacture after 1830 (Stewart-Abernathy 1980:33). The other two nails were cut specimens, but the heads were too rusted for further identification. Five flathead screws (each 5 in. long) were found with 24 of the wire nails and five coffin lid thumb screws in the fill of Historic Burial 42; these were all most probably part of the coffin lid closure, from which the wood had since disintegrated. Of the 16 nails from Historic Burial 13 (which was partially destroyed by Backhoe Trench 2), some were still embedded in wood from the top of a coffin side panel. Ten other coffin lid thumbscrews were found in the cemetery area, other historic grave fill, and on the surface after the site was stripped.

Five fence staples were recovered along with numerous pieces of wire, including one piece that was identified as "hog wire" with a 76 cm mesh size. This piece (found just west of Levee Transect Units 7 and 8 on the edge of the cemetery) was .46 m long and included the top of the fence and the first horizontal level below it. Other fragments also showed the coiled attachment of the mesh to each horizontal element. One piece of four-pronged barbed wire was found in unit S79.27 E161. These wire fragments and fence staples indicate that at least portions of the historic cemetery were fenced, although it cannot be ascertained from the archeological debris whether there was a whole cemetery fence or just individual grave fences.

Iron Containers

Two concentrations of thin iron fragments, one with 16 pieces and the other with 61, may represent two crushed tinne cans. The smaller concentration was found on the surface of the 1927 flood deposits in old E-W Trench 2 when the site stripping began, while the other can came from a column sample (S49.27 E159) within the larger excavation unit S48.77 E157. It may have been within an animal burrow.

Ammunition

A variety of firearm ammunition was found at Cedar Grove, including five shotgun shells or fragments, three bullet shells, and five pieces of lead which may represent spent bullets. These artifacts show hunting and/or target practice in the vicinity of the site, with the shotguns probably being used for waterfowl and small game, while the target(s) for the bullets are more difficult to specify.

Of the five pieces of lead, only one can be designated as a blunted bullet with some certainty. This was a 38 caliber projectile that had splayed on impact with a solid object it could not penetrate. Of the other four pieces one may represent a .22 projectile, another a .30 projectile, and the other two are flattened into oblong shapes and cannot be measured for original diameter. None of these lead pieces could be sinkers as they are not grooved or drilled for line attachments. The two oblong pieces resemble pie crust weights used in baking; such an artifact is unlikely to be found outside of kitchen or kitchen midden deposit. The .22 lead piece was found in the fill of Historic Burial 42, the .30 piece was found on the east side of the levee after the midden was stripped, the .38 bullet was recovered in unit S79.27 E161, within the historic cemetery, and the two other pieces came from S57 E184 roadbed deposits and Feature 20 in the indirect impact zone.

Coins

Two Liberty "V" nickels were recovered. One minted in 1889 was recovered from the waterscreened levee overburden in Levee Transect Unit 11. The second coin, minted in 1900 was found with a metal detector 1.11 m west of Levee Transect Unit 10. These coins could have been lost by road travelers, cemetery visitors, workmen, farmhands, or grave diggers.

Personal Artifacts

Two buttons and a pipe fragment were the only personal items recovered in the excavations. The face of a two piece ladies brass button was recovered on the surface after the final stripping of the overburden. It had the face of a long haired woman, wearing a headband. One other button was made out of porcelain and was found in the levee overburden deposits in Levee Transect Unit 4.

The ceramic pipe fragment was recovered on the surface west of the levee after the stripping operations. It was from the rim of a kaolin pipe, and measured only 8.8 mm at its longest dimension along the circumference of the rim. Such pipes were common between 1800 and 1940 (Stewart-Abernathy, personal communication).

Ceramic Wares

Only 15 pieces of ceramics were recovered during the data recovery besides the porcelain button and pipe fragment. Only three of these were possible tablewares, a piece of undecorated whiteware found in the plowed midden deposit (Stratum 4) in unit S72.5 E185, another undecorated whiteware fragment found east of the levee on the surface after the final stripping, and a piece of a light blue banded annular ware mug found on the site surface also after stripping. Banded wares were popular between 1840 and 1900.

The rest of the ceramics were 11 stoneware sherds, all having an Albany (dark brown) slipped interior surface, though the exterior surface treatment varied. There were several sherds with a Bristol (cream colored) slipped exterior, which date between 1880 and 1900 for the period of their most common manufacture. These sherds were found in the initial stripping of the site, in waterscreened levee overburden deposits in Levee Transect Units 2 (two sherds) and 8, in column sample S80 E175 (0-10 cm), and in the backdirt waste of the levee after the final stripping. Two sherds had salt-glazed exteriors; they were found during the initial stripping on the surface. One stoneware sherd had Albany slip on both surfaces, which was common between 1850 and 1900 (Stewart-Abernathy, personal communication). It was recovered in the levee overburden deposits in Levee Transect Unit 10. The surface on the last stoneware sherd (from Levee Transect Unit 5 overburden deposits) was defaced, and only the Albany slip interior was visible.

Glass

Of the 138 glass fragments recovered only five were flat pane glass while the rest were from containers or bottles. The flat pieces came from Backhoe Trench 2, which disturbed Historic Burial 13, a child burial. This plate glass probably served as a bust cover.

One milk glass vase, broken in 43 fragments, was recovered from the vicinity of the Conner grave, Historic Burial 10, however, disturbance to the area from the earlier grave relocation made the actual assignment unclear. One other piece of milk glass, found in Levee Transect Unit 2 due east of the Conner grave, could be from the same vase.

Of the remaining glass, distributed mostly in small pieces in historic deposits, 64 pieces were clear (or lightly tinted green or pink) bottle glass, five pieces were green bottle glass, and 14 pieces were of brown bottle glass. Nine of the brown fragments came from one bottle and 17 of the clear fragments were also from a single bottle; both had the necks preserved. These represented two of the four bottle necks that were recovered.

One neck was clear, and lightly tinted pink; it was found in the indirect impact zone when East-West Trench 4 was reopened. This neck once had a wire fastener to hold down a cork stopper. Such bottle fasteners date sometime between 1880 and 1920 in their period of manufacture. A similar bottle was found in a well at the historic tenant's house at the

Toltec site (3LA42), near Scott, Arkansas (Stewart-Abernathy, personal communication). A bottle neck that had an earlier wire and cork stopper arrangement, dating between 1840 and 1880 in its period of manufacture, was found in the backdirt from the machine stripping of the west side of the levee. This bottle was made out of dark brown glass. A bottle found just west of levee Transect Unit 6 had the most recent type of fastener, a crown cap. The invention of this bottle closure predated the invention of the automatic bottle machine in 1903; it was manufactured in a three piece plate bottom mold, with the crown cap formed by an "improved" lipping tool probably between 1892 and 1903 specifically for the "Stamps Ice and Fuel Co." whose label shows as embossed letters from the mold blowing on the light green tinted transparent bottle body, which has many trapped air bubbles. Stamps, Arkansas is approximately 20 miles by road from the Cedar Grove site. The fourth bottle neck was from a light green tinted clear medicine vial which was found in the historic roadbed after the stripping. Such bottles are difficult to date as they were manufactured from the mid-eighteenth century through the last quarter of the nineteenth century (Stewart-Abernathy, personal communication).

Building Materials

Building materials are conspicuous by their absence at Cedar Grove. Only one brick fragment, weighing 118 g, was recovered just southeast of S141 E130 in the indirect impact zone. No other building materials were found and it is unlikely that a historic structure was present anywhere in the immediate vicinity of the excavations.

EVALUATION OF THE HISTORIC ARTIFACTS

The artifactual debris, both in the types of materials recovered and their distribution, fit the pattern of the historic archeological features and documentary evidence for the use of Cedar Grove as a historic cemetery flanking a levee, roadbed, and cultivated field. Structural building materials and household midden debris were nonexistent.

Many of the metal artifacts indicate construction techniques of slip scooping on the levee, or else roadbuilding, and/or cultivation. The few vessel fragments found were predominately beverage or other liquid containers (stoneware and glass). Pieces of barbed wire and hog mesh fencing probably guarded graves in the cemetery. Coffin nails, flathead screws, decorative thumbscrews, lead moldings, and glass coffin plates.

The few artifacts which could be identified as to probable time span of manufacture are predominately post-1840 to early 1900s. The two most specifically dated artifacts, the 1889 and 1900 coins, were found associated with the levee, but it is not clear whether they were deposited during construction activities or were lost by a later visitor to the site. These dated artifacts are consistent with the known history of the area, with cultivation underway by the 1840s, and the site being sealed by the floods of 1927-1930.

The distribution of historic artifacts other than those directly associated with the historic graves is predominately in the levee overburden, the historic roadbed, or in cultivated midden deposits. One possible explanation for many of these artifacts especially the coins, buttons, glass vase, ceramics, and bottles are that they were cemetery offerings. It was a common Black American practice throughout the South for relatives of the deceased to deposit such items on the graves (Combes 1972; Parsons 1923; Vlach 1977). Such practices were continued by transplanted Southern Blacks on Staten Island (Schuyler 1972). Unfortunately the 1927 land surface was lost during the stripping operation so that this possibility could not be tested. The presence of household goods without any indication of a nearby building does suggest that this practice could have occurred at Cedar Grove. Further research at the extant cemeteries and with informants is needed to confirm this explanation of some of these historic artifacts. The other artifacts confirm that the historic land use consisted of a levee with a cemetery on its west side and a roadbed separating it from cultivated fields to the east. Occasionally hunters or target shooters passed through the area, leaving a thin scatter of spent ammunition.

Chapter 4

METHODOLOGY

**by Randall Guendling, Murray K. Marks,
Jerome C. Rose, and Lawrence Gene Santeford**

During the month of June 1982 a field and laboratory protocol was developed for the excavation and analysis of the Cedar Grove historic cemetery which would comply with the Scope of Services for Change Order 002 Contract Number DACW 29-80-C-0059, which had been negotiated between the New Orleans District Office of the U.S. Army Corps of Engineers and the Arkansas Archeological Survey. The historic nature of the cemetery, limitations of time and financial resources, and the stipulation that all grave lots be relocated to a new cemetery within 24 hours required extensive modification of standard excavation and laboratory procedures. This chapter provides a description of the methodologies employed in each of the following research phases for the Cedar Grove historic cemetery project: excavation strategy, archeological analysis strategy, osteological analysis strategy, cemetery excavation, artifactual field data collection, osteological field data collection, archeological analysis, and osteological analysis.

EXCAVATION STRATEGY

The project osteologist and the staff of the Arkansas Archeological Survey, using the experience gained from the 1980 excavations of the prehistoric Cedar Grove site, constructed a research design which would maximize data recovery while minimizing expended person hours. Construction of the excavation strategy was facilitated by the previous identification of all features to be excavated (Figure 2-1). The entire direct impact zone was to be mechanically stripped exposing all grave outlines and each grave was to be labeled with its 1980 identification number. Grave excavation was to proceed along the north-south grave rows beginning along the east edge. Each grave was to be probed for depth below surface and a backhoe would remove the overburden to within 30 cm of the top of the casket. Two excavation teams each composed of three persons would expose the casket, artifactual material, and skeleton using hand tools. All artifactual material encountered in situ would be recorded as to location. The skeleton and casket material was to be exposed, photographed, and mapped prior to removal. To reduce the time required for excavating each grave, the usual practice of meticulous cleaning prior to photography had to be eliminated. In order to prevent any material being lost a special removal strategy and skeletal record form was designed.

The first page of the prepackaged skeletal record form contained sections for recording burial type, body orientation, body position, and field observation of age and sex (see Appendix I). The next pages provided a drawing of a skeleton and list of all skeletal elements for recording a skeletal inventory as quickly as possible. The fourth page contained blanks for recording all artifactual material, while the fifth was for recording all skeletal material. These lists would be keyed to the grave map drawn on grid paper provided on the last two pages. Carbon paper was provided to produce two drawings which could be detached and a copy sent to the laboratory archeologist and laboratory osteologists. In addition, each excavator was to keep a standard field log of the excavation.

Once the skeleton was mapped and photographed, the skeleton and associated artifactual material was to be removed in five spatial quadrants: head; right arm, shoulder, and thorax; left arm, shoulder, and thorax; right pelvis and leg; and left pelvis and leg. All skeletal and artifactual material would retain these spatial labels (A, C, B, D, and E) throughout the washing and data collection phases. This procedure was to be employed so that spatial data would not be lost for material not recovered in situ. Upon removal of the skeleton and associated casket material, all grave fill was to be removed by labeled quadrant and water screened to ensure recovery of all small bone fragments and artifactual material. This procedure was designed to reduce grave excavation time from the usual eight hours to two hours per individual grave.

Excavation personnel were chosen for their excavation experience and knowledge of human osteology. Randall Guendling (Arkansas Archeological Survey) was selected as field supervisor because of his supervisory experience during the 1980 Cedar Grove excavations. Keith Condon (University of Illinois Medical Center) was retained as the field osteologist because of his extensive experience in mortuary site excavation. The excavation crew (Mark Blaeuer, Paul Bauman, Rebecca House, Ronald Laurin, and Patti Thomsen) was selected for their excavation experience and familiarity with human osteology.

FIELD ARTIFACT DATA COLLECTION

The development of the field laboratory protocol was determined by the Scope of Services and the requirement that all grave contents be relocated to a new cemetery within 24 hours of excavation. These circumstances made it imperative that the data to be collected would be exactly stipulated and that the protocol would remain unaltered throughout the field phase. Any alteration would render the data meaningless. The artifactual material would be separated out at the washing station using labeled containers to preserve the provenience information. All artifacts were to be delivered to the photography laboratory for description, photography, and identification by the historic archeologist, David Kelley (Tulane University). The goal of the artifact analysis was to describe the form, function, and chronological characteristics of each item for interpretation of the mortuary program. Provenience information was to be incorporated within each artifact description.

FIELD OSTEOLOGY DATA COLLECTION

The osteological methodology to be employed at the Cedar Grove site had to be an extensively altered version of the standard procedure employed at the University of Arkansas Osteology Laboratory. Again, the Scope of Services, financial and time limitations dictated an abbreviated and streamlined osteology protocol. The major data categories chosen for collection included: demographics, paleopathology, and genetic affiliation. The specific data sets chosen for collection from each category were determined by the availability of comparative data and the amount of time required to obtain each set. The following discussion of the methodology is presented with reference to the osteological data sheets located in Appendix II.

Each osteological recording form was prepackaged to assure that all pertinent forms would be filled out before reburial and that none would be lost after the analysis was completed. The cover sheet served as a control form which listed analysis completed, photographs taken, and specimens collected. Each skeleton would be laid out in anatomical position for a detailed inventory to be made by marking each bone as complete, fragmentary, or absent.

The demographics category included sex, age, and skeletal measurements. Sex determination employed a modification of the procedure developed by Acsadi and Nemesseri (1970) where each morphological and metric feature useful in sexing was scored on a scale of +2 (hypermasculine) to -2 (hyperfeminine). A weighted mean score for all observed features would determine the sex of each individual. The morphological standards and metric distribution had been drawn from the osteological literature (Acsadi and Nemesseri 1970; Bass 1971; Brothwell 1972; Krogman 1962; Ubelaker 1978; among others), standardized by seriation of hundreds of prehistoric skeletons, and incorporated into an Osteology Standards Manual used routinely at the University of Arkansas. Since these data were derived from prehistoric American Indian material some of the sex score standards had to be adjusted for use with historic Black Americans by using the information provided by Krogman (1962:112-152). Standard procedures require that each trait used for sexing be seriated for each skeletal sample to ensure consistency and to identify bias. Unfortunately this would not be possible at Cedar Grove and it was imperative to obtain a field osteologist who had experience working with Black American skeletal material.

Age determination of children was to employ visual developmental standards for dental growth (Schour and Massler 1945). The inadequacy of the Schour and Massler (1945) growth charts in both sample size and estimation of variation range are acknowledged, but the more adequate radiographic standards are unsuitable for visual assessment. However, the radiographic standards provided by Demirjian and Levesque (1980) and Moorrees et al. (1963a; 1963b) would be considered in the final age assignment. Subadult age determination was also to employ the age sequence of epiphyseal union as provided by Krogman (1962:33).

Age determination for adults was to utilize pelvic criteria. Each pubis would be scored using the Todd system with the Brooks modification (as cited

in Krogman 1962:92-101), and the pubic cast system for males (McKern and Stewart 1957) and females (Gilbert and McKern 1973). The auricular surface age system employing both textual and photographic descriptions of each stage (Lovejoy, personal communication) was also to be employed. Each of these systems have their own strong and weak points and when used together provide greater reliability. Standard Arkansas procedure requires that these age criteria as well as others (e.g., suture closure, dental attrition, etc.) be seriated for eventual production of a mean age as recently described by Meindle et al. (1983). Since this could not be done at Cedar Grove, all age criteria would be recorded individually as raw scores for future recalculation of age.

The total number of skeletal measurements had to be reduced to fit the time limitations for data collection. A total of 41 cranial and postcranial measurements (as defined by Bass 1971) were chosen. The specific measurements were determined by the requirements for calculating stature, growth rates (Hummert and Van Gerven 1983), sexual dimorphism, and determination of genetic affiliation (Giles and Elliot 1962).

The paleopathology category was to include macroscopic observation of gross dental and skeletal lesions. Of the standard array of potential dental data, the following lesions were chosen for recording: caries, dental attrition, abscessing, calculus deposits, agenesis, and antemortem exfoliation. The procedures for observation and recording the data were to be those routinely employed at the University of Arkansas and specified in the Osteology Standards Manual. Caries recording was to follow the procedures of Moore and Corbett (1971), while dental attrition was to utilize the Scott (1979) method. These data were to be supplemented by one to one photographs of each dental arcade.

Macroscopically observed skeletal lesions were to be recorded using the system adapted by M. L. Powell for her dissertation research at Northwestern University. This system records each pathological lesion by a numerical code, textual description, and color coded drawing on a skeleton outline provided on the recording forms. The four digit numerical code provides the following information: (1) type of lesion (i.e., resorptive, osteolytic/proliferative, trauma, and neoplasm); (2) location on bone; (3) extent of lesion; and (4) status of lesion (i.e., active or remodeled). The textual descriptions and drawings provide clarification of the code for each lesion. Photographs of each lesion were to be taken for future rediagnosis.

Since nonspecific indicators of childhood stress have proven useful in understanding prehistoric morbidity and mortality patterns (Buikstra and Cook 1980), these data should also have been collected at Cedar Grove. However, time and budget would not allow the collection of Harris line or even enamel hypoplasia data. It has been demonstrated that histological enamel defects can be used as a nonspecific indicator of childhood stress (Rose 1977; Rose et al. 1978). Consequently it was decided by mutual agreement of the contractor and the Corps of Engineers, to collect one maxillary central incisor and one mandibular canine from each individual for future analysis.

Other critical data sets for dietary reconstruction and metabolic disease diagnosis could not be collected under the proposed mitigation plan. For example both trace element analysis (Gilbert 1977; Wing and Brown 1980) and

stable carbon isotope analysis (DeNiro and Epstein 1978; Vogen and van der Merwe 1977) are useful for dietary reconstruction. Histological analysis of bone can contribute to both the diagnosis of specific diseases as well as contribute to an understanding of aging and metabolic disorders (Huss-Ashmore et al. 1982; Martin and Armelagos 1979; Stout and Simmons 1979). Consequently a 5 cm long section of the femur midshaft was to be collected from each individual for future analysis. Small hair and cartilage samples were to be collected, if available, for similar reasons.

The genetic affiliation category was to include metric, morphological, skeletal nonmetric, and dental morphology data sets. The metric data set was to include the eight cranial dimensions required for the Giles and Elliot (1962) discriminant function formulae for genetic discrimination into three groups: European, American Indian, and African. The cranial morphology criteria for designating genetic affiliation included those features described by Krogman (1962:188-208). In addition a frontal and lateral photograph of each skull was to be taken for future shape analysis. Nonmetric traits have been frequently employed for determining genetic affiliation (e.g., Corruccini 1974). A total of 40 nonmetric skeletal traits were to be collected using the criteria and scoring system designed by Buikstra (1976a; personal communication). This system was chosen over other perhaps more suitable systems because it had been routinely used in the University of Arkansas Laboratory and there was no possibility of retraining the osteologists prior to the field session. The Buikstra system scores each trait as not observable, absent, or present in one to four possible variants. Bilateral traits were to be scored separately for each side. Dental morphology is also useful to establishing genetic affinities (Turner and Hanihara 1977; Cadien 1972), however, time and personnel would not permit these data to be collected. An alternative was to cast each dentition for future morphological analysis. After experimenting with several brands and kinds of commercial dental casting media, it was decided to use Duplicast and disposable mold trays. This material proved to be the easiest to use and most suitable for the difficult field laboratory conditions. The casting technique was practiced and modified until it produced perfect results each time.

Implementation of this research protocol required a time task analysis and careful choice of personnel for the field laboratory. Information from previous osteological analyses as well as additional time task studies were used to estimate a total time per grave estimate of five person hours exclusive of washing. This information was used to construct a task flow system for the field laboratory. Trial runs were conducted at the University of Arkansas to determine the equipment and supplies needed to set up a temporary laboratory on site. Lists were compiled, materials on hand and supplies were packed, and additional supplies were purchased.

A staff for the osteology laboratory was chosen to implement the osteology protocol. Mary Lucas Powell (Northwestern University) was hired because of her familiarity with the Arkansas methodology and her ability to bring a different perspective (from Northwestern University) on paleopathology to the project. She was assigned the position as laboratory supervisor because of her previous positions of field responsibility and her ongoing dissertation research on a large skeletal series. Ann Marie Mires

was obtained on loan from Louisiana State University again because of her familiarity with the Arkansas methodology and her experience with racial assessment from her work in Dr. D. Owsley's forensic anthropology laboratory. Murray K. Marks (University of Arkansas) was hired because of his experience working as an osteology assistant at the University of Arkansas and his availability for training in the specialized techniques required at Cedar Grove (i.e., specimen collection, photography, and dental casting). Leslie K. Stalfort (University of Arkansas) was experienced in skeleton washing and preparation. Each staff member was assigned specific tasks to be performed throughout the project to ensure continuity and consistency in data collection. A flow chart of tasks with detailed instructions was prepared and given to M. L. Powell for implementation in the field laboratory.

EXCAVATION OF THE CEDAR GROVE CEMETERY

The fieldwork portions of this mitigation were accomplished in three concurrent operations: the excavation of individuals in the cemetery, the on site data recording (to be discussed below), and the reburial of all individuals and artifacts at a new cemetery location.

The excavation approach to the Cedar Grove historic cemetery was dictated by the emergency nature of the work, as well as the data retrieval component of the research plan. The site had been untouched since the fall of 1980 and a thick mat of weeds obscured the grave outlines. Examination of the bankline revealed casket hardware and some skeletal elements in the slumped soils, adding confirmation to the suspected loss of some graves to the river. Mapping of the 1982 bankline (Figure 4-1) showed that 16 in situ graves, recorded in 1980 had been lost to river action prior to our arrival.

Probing of the historic burials in 1980 indicated that the individuals were apparently buried at varying depths. Since the original pre-1927 surface had been lowered in the 1980 excavations we were reluctant to initially strip much topsoil and consequently backbladed the cemetery with a small bulldozer. This cleared it of weeds and the area was then shovel skimmed till we relocated the two filled backhoe trenches crosscutting the cemetery from the 1980 excavations. Since these were the most easily recognizable features on the cemetery surface it was a relatively simple matter to reexpose the grave shafts and reestablish the numerical sequence initially assigned.

The graves closest to the bankline, and most immediately threatened, were cleared and excavated first. Excavation of succeeding graveshafts then proceeded moving from north to south away from the bank. The graves were excavated in roughly east-west lines rather than following the rows identified in 1980 to more quickly avoid a possible caving bank. Graves were so close together in many places that backdirt had to be placed in recently removed graves to the north to leave a solid surface for the movement of the backhoe.

The excavation of individual graves was conducted by two crews of two persons each, directed by the osteological field supervisor (Condon). A third two person team composed of a backhoe operator and an assistant exposed

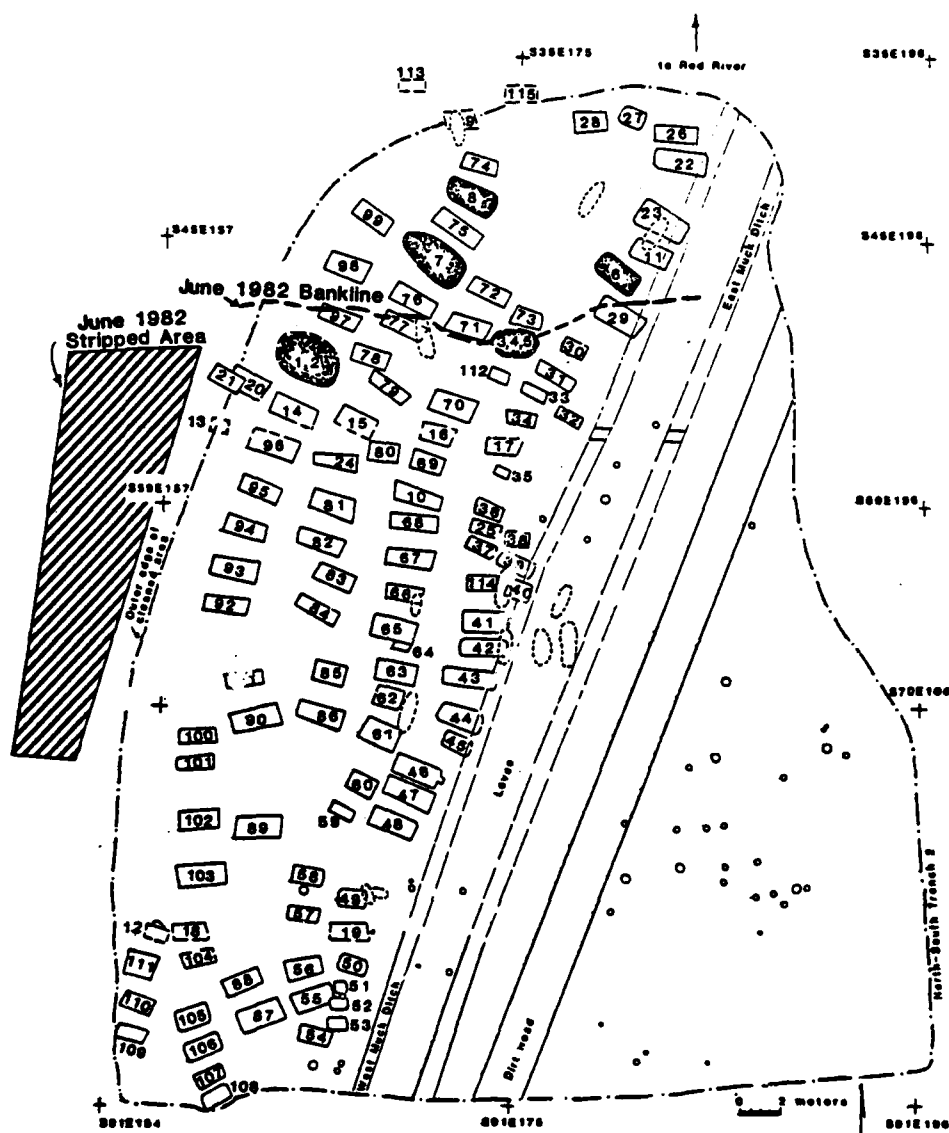


Figure 4-1. Map of Cedar Grove Cemetery during 1982 excavations. The dashed outlines represent prehistoric burials.

and opened the graves for the excavation crews. Once a graveshaft was redefined by shovel skimming, a flagging pin with the burial number was placed at the foot and the grave was probed to determine the depth of the burial. A tractor mounted backhoe was then used to remove grave fill down to the top of the coffin. This work was carefully monitored by the field assistant, a task made easier by the welding of a flat steel plate across the teeth of the backhoe bucket which produced "clean" cuts. Once the casket was reached the hole was widened to permit the excavators to work on either side of the casket. After the casket was exposed by the backhoe the burial excavation crew began the process of uncovering the burial. Metal construction scaffolding was first erected over the burial and covered with canvas or plastic to shield both excavators and the skeleton from the intense sun.

The exact definition of the casket shape required additional shovel skimming through the upper portion of the casket. Initial exposure of the casket revealed varying shapes which were caused by the collapse and slippage of the lids into the interior. The sides, however, remained in situ (upright) and their positions were used as the basis for defining casket shape and dimensions in the field records.

A system of quadrants was then set up over the casket, divided into five areas labeled alphabetically. These quadrants were used to control the provenience of items associated with the burials. Area A covered the head region, area B covered the upper left half of the body (from the shoulder to above the hip), area C the upper right half, area D the lower left half (from the hip to the foot) and area E the lower right half. A modified quadrant system was used for subadults and infants in the interest of efficiency. Subadults were excavated employing three quadrants with area A being the head region, area B the left side of the body and area C, the right side. Only two quadrants were used on infants with area A including the upper half of the skeleton (head and thorax) and area B the lower half (hips and legs). Although the quadrants were keyed to the body itself, the skeleton was pulled as a unit and the quadrants functioned as provenience control units for casket wood, hardware, artifacts and small bones such as phalanges. These items as well as the soil around and beneath the skeleton were water screened through 1 mm window screen by quadrant. Skeletal elements were separated from other artifacts and sent to the laboratory osteologists, while artifacts were bagged by provenience and sent to the historical archeologist.

Following the definition of the casket and establishment of the quadrant system, the area immediately outside of the casket was trenched, pedestalling the burial and facilitating easier exposure. The skeleton was then quickly exposed using wooden burial tools, brushes and trowels. The burials were cleaned only to the point that body position, placement of the hands and feet and artifactual associations could be determined. Once exposed, overall photographs, close up exposures and in situ artifact photographs using both black and white and color film were taken.

Concurrently with the photography, a series of Arkansas Archeological Survey skeletal record forms designed specifically for this project were filled out by either the osteological field supervisor (Condon) or his assistant (Blaur). The burial type (e.g. single, multiple), position,

compass orientation of the vertebral column, assessments of age and sex, inventories of missing or disturbed body parts, enumeration of artifacts and sketch maps including the casket shape and dimension were all recorded on the preprinted forms or in field notebooks. Once the documentation was completed the skeleton was removed, tagged with the burial number and taken to the osteological laboratory for processing.

A final task was the probing of the bottom and sides of the empty graveshafts to assure that no prehistoric burials remained under the historic burials. None were found in this manner.

Toward the end of the fieldwork a bulldozer was used to strip the overburden from the western edge of the historic cemetery (Figure 2-1) to make certain that all graves on that side of the cemetery had indeed been exposed. Under the supervision of the project administrator and the contracting officer's representative, approximately 85 square meters of overburden was removed down to the original clay surface. No additional graves were discovered and the stripping was discontinued.

The excavation crew was aware that there was a very slight possibility that aboriginal burials may be encountered. The unique soil conditions that effectively hid the Cedar Grove aboriginal cemetery (Trubowitz 1983) necessitated the probing of the entire site. The probing of the site for aboriginal burials was demonstrated to be highly effective in 1980 and even though this task was conducted at a systematic close interval, two factors of the site configuration served to mask some areas from adequate probing.

The first area was the historic graveshafts themselves; for obvious reasons we could not probe under them in 1980 although the area between each historic grave was carefully examined. The discovery that the aboriginal burials were oriented north-south meant that they were at right angles to the east-west oriented historic burials. Since the mean width of the historic burials was .9 m and the mean length of the aboriginal burials was approximately 1.8 m, we reasoned that no adult Caddo burial would be completely covered by any historic burial and thus would be likely to be discovered by probing. The possibility that a child may be buried under a historic graveshaft, as demonstrated by Aboriginal Burial 14 (Trubowitz 1983) remained. However, it simply was not feasible to probe all the historic graves at an angle. This situation was remedied by probing the bottoms of the graveshafts after each burial was removed in 1982.

The second area that masked adequate probing in 1980 was the historic levee itself, especially along the west side. The east side of the levee was stripped by bulldozer and adequately probed, however, we could not repeat the process on the west side because of the effect on the historic graves. Because of the height of the levee and the compact nature of that feature, especially the muck ditches, it was necessary to probe the west side at an angle to get under the ditches. Unless the probe is held at exactly the same angle each time, the probe holes will be farther apart at their extremes with the possibility of missing prehistoric interments, again especially a smaller child's burial.

Because of these two factors we expected the possibility of undiscovered aboriginal graves. Since both the New Orleans District Corps of Engineers and the Arkansas Archeological Survey considered the mitigation of the aboriginal component at Cedar Grove completed in 1980, no funds were available for salvaging any additional aboriginal burials. During the negotiations of this modification it was therefore agreed that the Arkansas Archeological Survey would arrange for the salvage of any aboriginal burials discovered during the mitigation of the historic cemetery at no cost to the government. This is indeed what transpired.

At the outset of this project we found it necessary to pull back a portion of the eroded and much reduced historic levee east and south of Burial 29. Several days later, after heavy rain storms, the backdirt piles from this operation were examined and revealed the fragmentary remains of a mandible, cranium and postcranial elements of an aboriginal child approximately three years old. Eventually the remains of 16 whole or fragmentary small Caddo vessels were also salvaged from the same vicinity by David Jeane (Arkansas Archeological Society) and John Miller (former station assistant, Arkansas Archeological Survey). As with all prehistoric materials from Cedar Grove, the skeletal elements were turned over to Dr. Jerome Rose, University of Arkansas and the artifactual materials to Dr. Frank Schambach, Arkansas Archeological Survey for curation and eventual analysis and publication.

The final task in the mitigation of the Cedar Grove historic cemetery was the reinterment of the individuals in a new location. A suitable plot of ground, protected by the new revetment and located approximately half a kilometer north-west of the original cemetery, was generously donated for this purpose by Mr. William Triplett, the owner of the Cedar Grove site.

Following the completion of the archeological analysis for each burial, the bags containing coffin parts and artifactual materials were temporarily stored in a third shed brought to the site for this purpose. After completion of the osteological analysis and collection of the autopsy samples, the skeleton and all nonskeletal remains of each burial were reboxed in standard burial boxes. The plywood boxes (48" x 18" x 12"), inside mortuary tags and exterior numbered brass tags were provided by the Red River Levee District No. 1 for the reburial process.

The skeletal elements, artifacts and casket remains were first placed in the box and a 3" x 5" aluminum mortuary tag containing the burial number, the sex of the individual and the age of the individual was inserted with the remains. The lid was then sealed and a small brass tag containing the burial number stamped on the surface was affixed to the end of the coffin. After consultation with the Contracting Officer's Representative, the remains were then held in the lockable storage shed protected from the elements and possible vandalism until they could be placed in the new burial location. A 24-hour guard was also mounted at the site for the duration of the project to assure that the remains were not disturbed more than was necessary.

The sealed reinterment boxes were then placed in four excavated trenches at the new cemetery location, an internal map of the cemetery was made

(Figure 4-2) and the burial boxes were then reburied with approximately six feet of earth. A headstone and four corner stones were later installed by the Red River Levee District at the Corps of Engineers expense.

ARCHEOLOGICAL AND OSTEOLOGICAL DATA COLLECTION

To furnish the most accurate and comprehensive account of the mechanics of the field osteology and photography laboratories a chronological perspective is employed. Protocol for both laboratories was steadily revised, reviewed and modified, especially in the early part of the project, until a smooth running processing technique evolved to handle all the anomalies encountered. An optimum time/task operation eventually accommodated all the variation in the skeletal remains (i.e., age, sex, degree of preservation, etc.). The internal layout of each laboratory and the washing stand is described along with each staff member and their respective job requirements. The step-by-step process that each skeleton passed through (washing, analysis, photography, autopsy collection) is then described including all the methodological modifications that augmented each step. Finally, some comments on the project and ways to improve future similar endeavors are reported.

The first field day (June 17) was devoted to the construction and set up of the two laboratories in the portable aluminum buildings that were delivered to the site the previous day. The buildings measured approximately 20 by 10 feet with one door and a window on either side of the door. Tables were constructed from plywood sheets (3' x 8' x 1/2') with sawhorse legs (Figure 4-3).

The photography laboratory included one Polaroid (MP-4) camera with black and white (Polaroid +/- 665) film, one 35 mm single lens reflex camera with black and white canister roll film, one 35 mm single lens reflex with color slide canister roll film, and one 4 x 5 camera to serve as a backup for the Polaroid. Materials for dental casting and autopsy collecting are described as they were utilized in the processing technique. Likewise the standard photography record and all forms for analysis in the osteology laboratory are described as they were implemented.

Specific job descriptions were to be as follows: Leslie Stallfort; wash entire skeleton, collect hair and/or cartilage sample (if present) and if time permitted help with laying out the skeleton in anatomical order and begin inventory; A. M. Mires; take inventory of skeleton, collect skeletal measurements, assess age, sex and racial classification; M. L. Powell; inventory the dental structures, assess gross macroscopic pathology of the bones and collect nonmetric traits; M. K. Marks; take Polaroid photographs of skull (four standard exposures), 35 mm color slide and black and white of any pathological conditions, make dental casts of all complete dentitions, and collect autopsy specimens from each skeleton. Several parts of these specific assignments were altered as it became obvious that certain parts of the analysis took a much greater (or lesser) time than originally predicted (i.e., Stallfort rarely had time to take inventory as washing was more than a fulltime occupation), Mires and Powell occasionally exchanged duties as they saw the need, and Marks severely limited the number of pathologies photographed with the 35 mm camera as he discovered that the dental casting

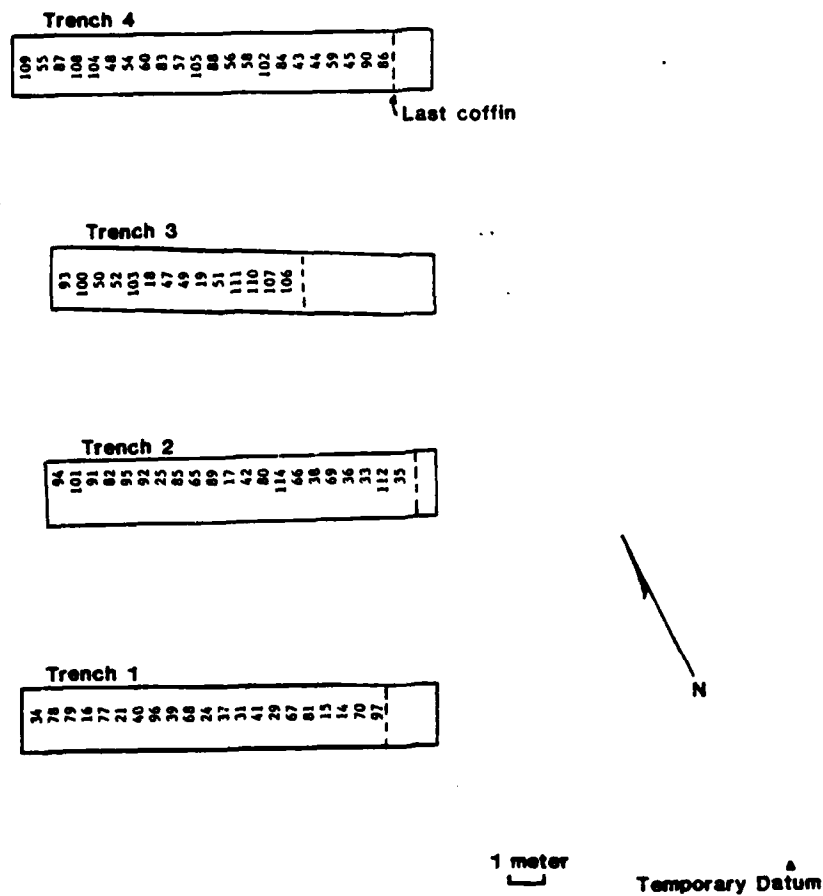


Figure 4-2. Map of inside of grave relocation cemetery

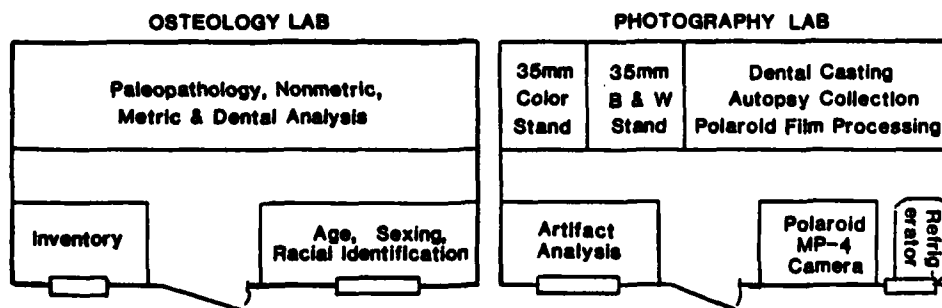


Figure 4-3. Floor plan of Cedar Grove temporary field laboratories

was a more time consuming task than expected. All of these areas will be mentioned again as the step-by-step processing of skeletal material is described.

The washing station was constructed of 2 x 4 legs and braces with a plywood top that served as a working surface for the placement of washing tubs, drying screens, alcohol, toothbrushes, picks, etc. A parachute was rigged up to shade the activities and prevent the earthen matrix from baking onto the bones prior to washing as well as to allow them to dry at a rate that would not warp or crack the bone. Stallfort was the first of the laboratory team to encounter the skeletal remains directly from their graves. The skeleton usually contained a fair amount of earthen matrix occluding all the orifices, foramina, and braincase of the skull, adhering three to seven vertebrae together, and clods of matrix containing entire hands and feet. Much of this matrix was intentionally included with each burial so as not to miss any personal mortuary items. This practice required very careful cleaning techniques to be employed and a heavy reliance on screening all the mud. The bones were all washed in tubs of river water pumped up to the washing station and most of the matrix was removed by gentle hand wiping or light brushing. Hair and cartilage samples were not washed and were placed immediately in a bag to separate them from further contamination. The teeth and supporting oral structures were cleaned in a 50/50 solution of alcohol and water to prevent cracking and splitting upon dehydration. When the entire skeleton had been washed it was placed on one or two screens (i.e., wood sides with one quarter inch hardware cloth bottoms) to thoroughly dry. Drying time varied, of course, depending on the day, but usually consumed two to two and a half hours. The materials found in the water screening procedures were placed with the drying skeleton and Stallfort started the process again or began to layout previously dried remains for inventory and analysis. Stallfort wore polyvinyl disposable gloves throughout her cleaning operations.

The specific task of analyzing each burial began by placing the completed field excavation form in a labeled folder with a blank laboratory form packet, laying out the skeleton in anatomical order, and conducting an inventory of the remains. This task was performed by any of the four staff members, according to their availability. There were several instances where field excavation crew members aided in this task because of rainy weather or simply finding themselves between burial excavations. This particular project used specially designed analysis forms.

Several changes were instituted by the laboratory staff when filling out the inventory. On the cranial inventory the staff deleted detecting and/or siding the auditory ossicles (malleus, incus and stapes). On the postcranial inventory the staff treated the five coccygeal elements as one unit and simply counted and sided the ribs instead of attempting to distinguish 1 through 12 by their morphologic features. Likewise, the carpals, metacarpals, phalanges, tarsals, metatarsals and phalanges were all treated as units that were paired and counted. The staff implemented these shortcuts as a time saving device. Few data were lost with this procedure because when pathological lesions or anomalies were encountered the bone was specifically identified.

The staff member who completed the skeletal inventory usually completed the age forms by recording dental development and epiphyseal union for subadults and for adults the Todd, McKern-Stewart, and Gilbert-McKern systems were employed on the pubis, while the Lovejoy technique was used on the auricular surface. Mires was the final consultant and expert on all age assignments and routinely made the final age assessments. Sex was determined using the previously described methods by Powell in consultation with Mires. Mires obtained all skeletal measurements using the definitions found in Bass (1971) and standard osteometric equipment (i.e., head spanner, osteometric board, spreading and sliding calipers, and tape measure). Measurements were recorded in millimeters on the analysis forms. Diaphyseal measurements were taken on infants and juveniles to provide growth data for future analysis. Nearly all postcranial measurements were obtainable for adults, but only half produced complete craniometrics because of breakage and the lack of time available for reconstruction. Cranial and postcranial nonmetric traits were collected by Mires and recorded bilaterally. Nearly one hundred percent of the adult individuals produced nonmetric data.

Powell surveyed all dentitions for inventory, formation, eruption, antemortem loss, caries, abscessing, calculus, and dental attrition following the procedures previously described. Powell also inspected each bone for evidence of pathological lesions and recorded the results on the pathology code sheets. Each lesion was assigned a descriptive numerical code on the space provided for each skeletal component or the space was designated zero for no lesion. A detailed textual description was provided for each lesion and drawings of the human skeleton were colored (i.e., different color for each lesion type) to indicate lesion extent. These drawings provided "at a glance" location of each lesion which proved useful in the photography process.

The osteology laboratory staff provided three very useful diagrams to facilitate progress during the span of the project: first, a color coded map of the cemetery area from the 1980 excavations indicating excavation progress; second, a demographic histogram where colored dots were placed beside the burial numbers (i.e., red for adult females, blue for adult males, and green for subadults); and third, a color coded task checklist of duties performed by the laboratory staff indicating the analysis status of each burial.

Mires and Powell determined what specific attention was needed for each burial in the photographic laboratory and communicated this information to the photographer, Marks. The skeletal remains were transferred to the photography laboratory by Powell, Mires or by Marks, who was returning finished burials. Since the burials were labeled only with tape tags it was important that they be kept together and moved as an entire burial unit to the photography lab. The standard photographs were taken with the Polaroid MP-4 camera and +/- 665 Polaroid film. For complete or nearly complete skulls four basic photographs were taken: a frontal view of the skull in the Frankfort plane (which sometimes failed because of the tilt required to adhere the mandible to the cranium for the exposure); a left lateral view of the skull in the Frankfort plane; a one to one exposure of the mandibular dentition (one to one referring to lining up the centimeter scale on the specimen to a similar centimeter scale taped inside the viewfinder of the

camera); and a one to one exposure of the maxillary dentition. Polaroids were also taken of any pathological condition or genetic anomaly as prescribed by Powell or Mires. This procedure was followed in the earliest part of the project, but was soon abandoned because of the time constraint. Many of these features were photographed with the 35 mm cameras to facilitate keeping pace with the osteology laboratory. The film for the MP-4 was kept in plastic bags in the refrigerator and was always ready for use. The prints from the Polaroid were coated with a fixing agent and the negatives were placed in a negative clearing agent container that was taken to the motel at the close of the day where the negatives were washed and dried.

The 35 mm black and white photographs were identical to the 35 mm color slide photographs and as previously mentioned, included views of the pathological specialities, genetic anomalies, comparative femur curvature, pubic symphyses and auricular surfaces of the pelvis. The latter three were curtailed half way through the project because of time constraints, but it is believed that there was a representative sample of these areas of special interest. Both 35 mm cameras functioned properly without fail, although we severely missed a close-up lens to record some discrete lesions common to many of the infant remains. The two gas powered generators that serviced both laboratories wavered only slightly when the photolights were in use. However, one could not take Polaroids simultaneously with 35 mm so a back and forth routine was employed.

Dental casting presented the smallest of all efforts once Marks learned the correct proportion of materials to use. To achieve the consistency required to produce a successful cast he found that a greater proportion of hardener needed to be applied to the silicone plastic impression material. Both materials were kept stored in the refrigerator and mixed with a chemist spatula on a glass plate until the desired consistency was achieved, being careful to expel all air bubbles from the mixture. This mixture was poured into dental impression trays that were coated with wax and had ends taped to prevent the casting material from flowing out the back of the impression tray. The oral structures were sprayed with a generous coating of vegetable oil cooking spray (Pam) to facilitate easy removal from the casting matrix, and then submerged in the casting material in the impression trays. Setting time was about 10 to 15 minutes depending on the humidity and temperature of that particular time of day in the photography laboratory. It tended to be at least 5°F warmer in the lab because of the floodlight operation. The oral structures were released from the matrix with relative ease when the matrix was totally dry. The plastic impression trays were then incised with the individual burial number and placed in a plastic bag and kept in a cool place. Where there were less than five teeth in either maxillary or mandibular arcade the casting procedure was not performed.

The autopsy collection was about the only procedure that remained unaltered throughout the project's duration. The bone sample extracted was a 5 cm section of femur midshaft. Marks measured 2.5 cm to either side of the midshaft point marked by the midshaft measurement taken earlier. Marks first used a 1/4" electric sabre saw to cut the bone section and then discovered that a coping saw did as fine a job without the possibility of losing control of the saw and the bone. The bone section was placed in a small Ziploc top bag with the burial number affixed. These were collected and kept in a larger

plastic bag with the dental samples. One central maxillary incisor (right or left) was extracted along with one mandibular canine (right or left) from the adult dentitions. A maxillary lateral incisor was collected instead of a missing central incisor. The same samples were retrieved from the subadult individuals by cutting through the alveolar bone and also collecting their already erupted deciduous counterparts. Dental samples were placed in the same Ziploc top bag as the femur section and kept in a cool, undisturbed corner of the laboratory.

David Kelley, also working in the photography lab was responsible for the artifactual analysis of each burial and worked on the same grave lots that the osteology and photography laboratories were processing. He received the artifacts at the washing station (each excavation quadrant packed in a separate bag) as the skeleton entered the analysis stage. He listed, described, and photographed all artifacts (personal mortuary components, organic additions, etc.) by burial quadrant. He and Marks simultaneously utilized the floodlights for photography. The majority of the artifacts were recorded in 35 mm color slides as well as black and white film.

When the photography was completed for each burial, it was returned to the outside of the osteology laboratory where the final paperwork and checks for completed forms were taking place. From this point any available laboratory or excavation staff member carried the remains over and placed them in their burial box.

On the penultimate day (June 30) devoted to data collection, each staff member was requested by Powell to conduct a time/task analysis of their particular assigned duties for ultimately obtaining estimates of the average time required for the performance of each particular task. Such an analysis had been deliberately postponed until a time when the protocol had been in operation long enough for each staff member to achieve a high level of efficiency. These times should be considered as ideals rather than averages for the entire project and are presented in Table 4-1. Several burials required far more time for analysis than did others, depending upon their degree of completeness and the presence of pathological conditions. The first few burials to be processed required almost twice the time required as burials processed later in the project, when the routine of analysis and sample collection had become well established.

At the termination of the project, Powell gathered together the osteology and photography laboratory staff to discuss obvious strengths and weaknesses of the protocol and equipment. Of paramount significance to the project as a whole was the high quality of its carefully selected personnel, who without exception performed their duties in physically arduous surroundings with the highest degree of professionalism.

The physical setup of both laboratories was adequate to the needs of the project, with several lesser exceptions to be noted below. More drying screens and a drying rack would have promoted faster turn over time at the washing station. The assignment of specific tasks to specific crewmembers (with the mentioned exceptions) encouraged a standardization of analysis and data collection. Unpreventable exceptions to this routine occurred when rain halted progress in the excavation schedule on several occasions, and

TABLE 4-1

Results of Time/Task Analysis of Field Laboratory
Procedures at the Cedar Grove Cemetery

<u>Task</u>	<u>Average Time in Minutes</u>	
	<u>(Adult)</u>	<u>(Infant)</u>
1) Washing	90	45
2) Layout, Inventory	25	30
3) Age Estimation	15	10
4) Sex Estimation	7	--
5) Metric Data Collection	15	5
6) Discrete Trait Data Collection	20	--
7) Dental Observations	15	20
8) Skeletal Pathology Observations	25	20
9) Photography Laboratory		
Polaroid Exposures (Standards)	17	17
35 mm (Average Time)	20	20
Bone Sample Collection	5	5
Dental Casts	20	--
10) Assembly for Reburial	15	15
11) Paperwork (All Tasks, Plus Checks)	<u>15</u>	<u>15</u>
Total Time Required Per Skeleton	284	202
	(4.7 hours)	(3.4 hours)

appropriate excavation staff members were then employed for several laboratory tasks, primarily washing. Condon, the burial supervisor, assisted on those occasions in the collection of data on discrete skeletal traits, he was selected for this task because of his previous extensive experience with such data. Blaeuer, a graduate osteology student at the University of Arkansas, assisted during rain days and during the last three days of the project with washing, skeletal layout, inventory and epiphyseal fusion observations.

Two specific bottlenecks in the processing of the burials were manifested during the first week. As previously explained, Stallfort had a full time job in washing the skeletal material, which gave her no time to help with the layout of skeletons or basic inventory procedures. This inability to perform other duties probably resulted in the extra cleaning time required for burials due to the organic/earthen matrix affixed to skeletal elements. This dense matrix required more effort to remove, especially from the dentitions. Any available project member was required, therefore, to assist with washing to keep pace with the influx of burials from the excavation.

This task reassignment created a second problem, for the remaining three staff members had to devote additional time to the preparation of skeletons as they entered the laboratory, in addition to their assigned tasks of data collection and photography. The laboratory analysis of any given burial, as a result, lagged behind its excavation by at least one full day, if not two.

Although a fifth laboratory/photography staff person would have been no panacea, it would have eliminated the aforementioned shortcuts taken during the data collection phases. Another member would have minimized the backlog of unwashed, unanalyzed, and unphotographed burials. Had it not been for the two almost entire days of heavy rain, which freed excavation crew members to assist with laboratory tasks, it would have been exhaustingly difficult to complete the analysis within the specified number of allotted field days. All the burials were, of course, eventually washed and analyzed, while the photographic analysis suffered the greatest from the time constraint.

ARCHEOLOGICAL DATA ANALYSIS

Since all of the artifacts were reburied within a limited time period, it was necessary to employ photographs and field notes to study the historic materials. All notes, photographs and other records for each burial were organized into a separate file. This made it possible to give total attention to a specific burial, including both physical data and cultural materials.

Each file was first examined to compile maximum information on the cultural materials present. Excavation of burials was based on a quadrant system described previously. Infants were divided into two recovery areas with the area of separation at the pelvis. Older children and adults were separated into five recovery areas. Spatial factors were thus well controlled. In addition, some artifacts had been point-plotted, so their exact locations could be determined. Tables were compiled for each burial indicating locations of artifacts by quadrant and types of artifacts. Three

major groupings were used. The first included burial-related artifacts: casket handles, lid fasteners, plaques, nails, tacks and other items that related to the burial context. The second group consisted of cultural materials that could have been owned and used by the individual while alive: buttons, jewelry, shoe parts, and similar kinds of artifacts. The last group included miscellaneous items sometimes found in the burial context as a result of fortuitous circumstances: prehistoric pottery fragments, chert flakes, seeds, and related items.

As the tables were prepared, notes were also made of pertinent information contained in the field notes, including colors of paint used on caskets, locations and characteristics of some artifacts, casket shapes, casket measurements, and related information. Much of the latter information was not used in tables, but appears in the descriptions of the burials.

After the tables were completed, a description of each burial was prepared. Organization of information was based on the utilization of two major bodies of data. The first was called Mortuary Characteristics. It relates to factors of the interment, such as body placement, casket components, and related aspects. Two divisions within this section are: (1) Physical Aspects, including body orientation, body placement, and hand placement; and (2) Funerary Aspects, including casket shape, casket measurements, and casket hardware.

The second major portion of the description was labelled Cultural Characteristics. It includes divisions focusing on clothing components, grooming and related items, and non personal and related goods. The first one included buttons, shoe parts, cuff links, and similar goods. The second one included combs, jewelry that does not relate to clothing closure, and dental goods. The last part included items probably included in the burial accidentally, such as prehistoric pottery. In many instances descriptions are more thorough than those presented in the tables and more specific information is presented on locations of the artifacts in relation to the skeletal materials. Dating information is also presented as often as possible to indicate when various cultural materials could have been produced or used. Various resources, including collectors' books on buttons and related materials, archeological reports on other historic sites, and old catalogs were used. Significant information was obtained from a Montgomery Ward catalog of 1895 (Emmet 1969), and Sears Roebuck catalogs of 1897 (Israel 1968), 1902 (Amory 1969), and 1929 (Sears Roebuck and Company 1929). These catalog companies were frequently used for purchasing nonlocal goods by the Black residents of this region (Angelou 1970: 144). Similar artifacts were found in some of these catalogs and some aspects of change in artifact form and utilization were reflected by using catalogs from this longer time period. It is known that some of the artifacts present, such as porcelain, bone, and shell buttons, were used some years before the earliest catalog employed in the study. It is proposed that the use of earlier catalogs would not have contributed to any refinement of dating over that employed in this report.

Whenever possible, information from published works on folk traditions was incorporated to demonstrate how the archeological pattern conformed to or contradicted the folk belief. Romaine's (1976) guide to American trade

catalogs lists a 1893 catalog of the F. C. Riddle and Brothers Casket Company of St. Louis. At least some coffin makers in Arkansas apparently obtained components for caskets and related burial goods from this company (L. Stewart-Abernathy, personal communication). The librarian of the Missouri Historical Society of St. Louis was contacted, but indicated that the catalog was missing. Identifications were therefore made on the above knowledge, information contained in a historical source by Habenstein and Lamers (1975), and facts provided by Mr. Duane Nelson of the Nelson Funeral Home in Fayetteville.

A final section in each description presents a proposed burial date. This time period was based on a consideration of the earliest artifacts present, their potential period of manufacture and use, and other related factors. For example, shell buttons were produced in America in the post-1887 period. Therefore, it was proposed that if shell buttons were present with a burial, it probably did not date previous to ca 1890. At the same time, shell buttons were produced well into the 1950s. Since the cemetery was not used after 1927, the individual could not have been buried later than this. In one situation, shell buttons were present, but a 1902 coin was also present in the burial. This would indicate that the burial had to occur after 1902, although shell buttons with the burial could have been manufactured approximately ten years earlier. On the whole, most artifacts present with the burials provided little opportunity to propose more specific dates of burial.

After descriptions were prepared, consideration was given to burials by reorganizing the information by age groups. Six groups were employed, including infant (0-2 years); children (2-13 years); adolescent (13-20 years) young adult (20-30 years); middle aged adult (30-50 years); and older adult (50+ years). Burials within each of these age groups were color coded on the base map showing locations of the graves. Tables of cultural materials, individual burial descriptions, and the cemetery base map were consulted to determine if there were distinct patterns in locations of caskets of specific shapes, relationships between individuals of either sex and certain types of artifacts, and related factors. While the level of analysis was extremely preliminary due to time constraints, interesting patterns did appear to prevail.

As a final step, perspectives derived through the formulation of tables, preparation of descriptions, and preliminary interpretations of burial patterns, were used to list potential topics to be addressed in subsequent research. In the study of historic houses and other types of sites, the archeologist is unable to relate artifacts to specific individuals in most instances. By having excellent control over biological data of individuals buried at the Cedar Grove cemetery, and having a record of the sorts of artifacts present and their spatial relationships, excellent opportunities exist for addressing aspects of late nineteenth to early twentieth century Black economy, prestige, status, age and ownership of goods in southwestern Arkansas.

OSTEOLOGICAL DATA ANALYSIS

Upon returning from the field all notes, photographs, and specimens were processed as described below. Each set of autopsy specimens (i.e., femur sections, teeth, cartilage, and hair samples) were checked against the field laboratory records and burial analysis forms for proper identification. The specimens were labeled, photographed, and frozen in sealed containers. A list of all specimens is provided in Appendix Table AII. The dental molds were also checked against the records and photographs for proper identification, relabeled and stored in sealed containers for future casting and study. All film was developed, proof sheets made, and each negative (both Polaroid and 35 mm) was assigned an Arkansas Archeological Survey photo record number. Each photograph was checked against the photo log, field notes, and analysis forms for proper identification. Although each photograph contained a burial number identification label, occasional mishaps in the photography laboratory placed the wrong label with the specimen being photographed. All but one mislabeled photograph was correctly reidentified using the documentary information. The photographs with their photo numbers are listed by burial number in Appendix Table AI.

All field forms, field notes, record sheets, and laboratory analysis forms were duplicated for safety and one set is housed at the Arkansas Archeological Survey and the other at the University of Arkansas Osteology Laboratory. All field and laboratory forms were collected and filed by burial number. The field notes, proof sheets, and other material were cut up and mounted for filing by burial number. The end result of this process was a complete file on each burial containing all acquired data and photographs obtained during the field phase of the Cedar Grove project. Each form and data source for each burial was checked for errors, inconsistencies, and mislabeled information. In most cases the mistakes could be corrected because of duplicate recording, but in a few cases such as skeletal measurements the errors could not be rectified and they were then eliminated from the data base.

Each age and sex assignment was recalculated from the provided raw data and compared to published data for Black Americans provided by Krogman (1962:112-152). However, sufficient time was not available for statistical analysis and seriation of the age-sex data necessary for precise age-sex assignment. This must await future analysis. The numerical classification, textual description, drawings, and photographs for each pathological lesion were examined for errors, completeness, and diagnosis. The numerical classification data was prepared for future computer analysis and a pathology synopsis of each burial was prepared for the present analysis (see Chapter 5). The diagnosis for each lesion was checked against such standard paleopathology reference works as Steinbock (1976), and Ortner and Putschar (1981) as well as numerous other paleopathology journal articles and monographs. The pathological lesions were examined as a unit for each individual and tentative diagnoses were made with full knowledge of the fact that any one individual's lesions are seldom typical of a specific disease. Realistic differential diagnosis of disease syndromes requires a population analysis which utilizes both the distribution of lesions on each skeleton as well as across the skeletal sample (Buikstra 1976b; Palkovich 1981; Steinbock 1976). This approach would prove highly successful at Cedar Grove because

the epidemiological and death certificate data could be used in conjunction with the osteological findings. However, this endeavor is beyond the present Scope of Service and must await future analysis. Consequently the present diagnoses must be considered hypotheses to be tested with future research on the Cedar Grove skeletal sample.

Genetic affinities were assessed using the Giles and Elliot (1962) discriminant formula in conjunction with the recorded morphological traits which were interpreted with reference to Krogman (1962). It was unfortunate that only nine skulls produced the required eight cranial measurements for the Giles and Elliot (1962) technique. Although almost one-half of the adult crania were nearly complete at least one of the measurements could not be taken in the field. There simply was not enough time to permit cranial reconstruction during the field phase and now that the material is reburied these data cannot be recovered. It is hoped that future analysis of the nonmetric skeletal data, dental morphology, and metric data will resolve this problem. The nonmetric and metric data were prepared for future statistical analysis. In addition, the frontal and lateral photographs of the skulls can be given to experts in morphological classification for future reinterpretation.

During the course of the fieldwork it was noticed that many of the skeletons were not properly articulated within the graves. Consequently all field photographs, burial drawings, and field notes were examined for each burial to classify the kind and frequency of disarticulations for each burial. Analysis of these data should make a contribution to modern as well as prehistoric taphonomy of the human skeleton.

RECOMMENDATIONS

Three specific problem areas emerged during the preliminary analysis of the collected data and the preparation of this report which should be mentioned for the benefit of future researchers conducting similar projects. First, the amount of time allotted for excavation of each burial should be lengthened from two to three hours and one additional excavator should be added to the crew. The problem was not that the crew could not excavate a burial in the allotted optimal time, but that the maximum effort required could not be sustained day after day under difficult field conditions. Secondly, the amount of time estimated for osteological analysis should be lengthened from five to six hours per skeleton and an additional crewmember should be assigned to the washing station. The problem again is not due to the fact that the laboratory staff could not do the work in the allotted time, but that the effort could not be sustained continuously under the difficult field laboratory conditions (i.e., 100°F temperatures). The fact that the excavation and laboratory staff completed the project in the required time was due only to their stamina and dedication.

The third problem area and recommendation is that collection of artifactual and osteological data within a limited time frame in a field laboratory is not recommended and produced a number of problems. The fact that the photography laboratory could not be kept free of dirt and dust resulted in scratched negatives which are the only tangible remains of this

valuable archeological resource. Because the artifactual material was unique with no existing standardized typology and recording system, considerable data was lost. For example, if toward the end of the project a subtle variation in a type category (e.g., "At Rest" plaques) was recognized it would not be possible to go back and check all items assigned to that particular type. In addition, many modern materials such as plastics are not visually distinguishable and require more extensive tests such as microscopic examination and hardness testing. Similar problems emerged in skeletal data collection. Age and sex determination by the individual skeleton system is not optimal. The problems with precise age determination would not have occurred if the skeletal material could have been seriated and examined as a complete sample. In pathological lesion diagnosis subtle lesion distinctions were discovered well into the field session, but there was no opportunity to go back and reexamine the earlier skeletons for the presence of these characteristics. More importantly since diagnostic and lesion pattern analysis was conducted after the material was reentered there was no opportunity to go back and collect additional data for diagnosis confirmation. Finally, because there was neither the time nor personnel for skeletal reconstruction, considerable amounts of crucial metric data (especially craniometrics) were lost for future analysis. Because of these problems it is recommended that the material from similar projects be removed to an established laboratory for an extended period of data collection (i.e., six months to a year). Under these proposed conditions the same if not more data of better quality could be collected for the same financial resources expended on the Cedar Grove Historic Cemetery project. Several examples of potential savings are no per diem payments, close regulation of wages for each skill/task level, and the absence of having to offer higher wages to entice skilled laboratory researchers into the field.

Chapter 5

BURIAL DESCRIPTIONS

by Jerome C. Rose and Lawrence Gene Santeford

This chapter provides a description of the osteology and archeology of each grave lot in numerical sequence as required in the Scope of Service with the U.S. Army Corps of Engineers. The biological characteristics section includes demographics, preservation, and paleopathology. The demographic component presents summary statements of age, sex, and race for each burial, while these data are more fully discussed in Chapter 6. The preservation section includes the condition of the skeleton followed by a brief description of the degree of normal articulation of the skeleton in the ground. This is followed by a brief description of the skeletal components recovered with a detailed inventory provided in Appendix III, Table AIV.

In the paleopathology section brief descriptions of all pathologies are grouped for convenience into six etiological lesion categories: dental, infectious, developmental, degenerative, neoplasm, and traumatic. The dental descriptions include only premortem tooth loss and caries, while complete data sets for caries, abscessing, calculus, and dental attrition are provided in Appendix III, Tables AVIII, AIX, AX, AXI, AXII, AXIII, and AXVII. Infectious lesions are described, illustrated where appropriate, diagnosed where possible, and categorized as healed or active. The impact of infectious disease upon the Cedar Grove population is discussed in Chapter 6, while a detailed tabulation of pathologies is also presented. The developmental lesion category includes genetic anomalies, metabolic disfunctions, as well as dietary deficiencies. Descriptions of the degenerative, neoplasm, and traumatic lesions are also presented.

Since the photographs taken in the field provide the only generalized data source from the Cedar Grove Cemetery, a complete inventory is provided in Appendix III, Table AI. Autopsy specimens consisting of a canine, incisor, and 5 cm length of femur midshaft were collected for future analysis and are listed in Appendix III, Table AII. Additional biological data are provided in the following Appendix Tables: cranial nonmetric traits Table AV; postcranial nonmetric traits Table AVI; and skeletal metrics in Table AVII.

The biological description for each burial is followed by the archeology which is divided into three sections: mortuary characteristics, cultural characteristics, and proposed burial date. The physical aspects of the mortuary section includes body orientation, body placement, and positioning of

the hands. The body orientation provided here is the compass orientation of the spine, which because of shifting of the body and the fact that the grave shafts are larger than the caskets can be slightly different from the grave shaft orientation (Figure 4-1). The funerary aspects of the mortuary system include casket shape, casket dimensions, and casket hardware. The casket hardware are described, illustrated where necessary, and are enumerated in Appendix III, Table AXIV. The cultural characteristics section describes all noncasket artifacts and is divided into two components: clothing and other personal goods; and non-personal and related goods. The clothing category includes cloth, shoes, clothing components such as buttons, jewelry, and other body items. These items are described, illustrated where necessary, and enumerated in Appendix III, Table AXV. The nonpersonal category includes nonbody items such as plates, bottles, and other items placed in or on the casket. These items are also described, illustrated where necessary, and enumerated in Appendix III, Table AXVI. The bar located under the burial number in the figures is the photographic scale and represents one centimeter. Although the chronological specificity of each artifact is discussed in detail when first described in the above archeological sections, a summary statement of the chronological position of each burial is provided in the proposed burial date section located at the end of each burial description.

A total of 115 grave numbers were assigned to grave shafts during the 1980 excavations of the prehistoric component of the site. A total of nine graves (numbers one through nine) were relocated by the Cedar Grove Church and the Levee board to another cemetery during 1980. For the remaining graves, two numbers were used twice. Thus, numbers 3 and 30 as well as 4 and 73 designate the same graves respectively. Grave number 12, which apparently contained a casket, has been destroyed by heavy earthmoving equipment in 1980. An additional 16 graves were destroyed by the Red River between 1980 and 1982: Graves 11, 22, 23, 26, 27, 28, 71, 72, 74, 75, 76, 91, 98, 99, 113, and 115. Nine graveshafts were excavated during the historic cemetery mitigation and found to contain neither caskets nor skeletal material: Graves 13, 20, 32, 46, 51, 53, 62, 63, and 64. The remaining 78 graves were excavated and the recovered material is described below.

BURIAL 10

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 25-29 years.

Sex: Male.

Race: No metric or morphological indicators of genetic affiliation.

Preservation

Condition: Preservation was excellent and all bones were correctly articulated.

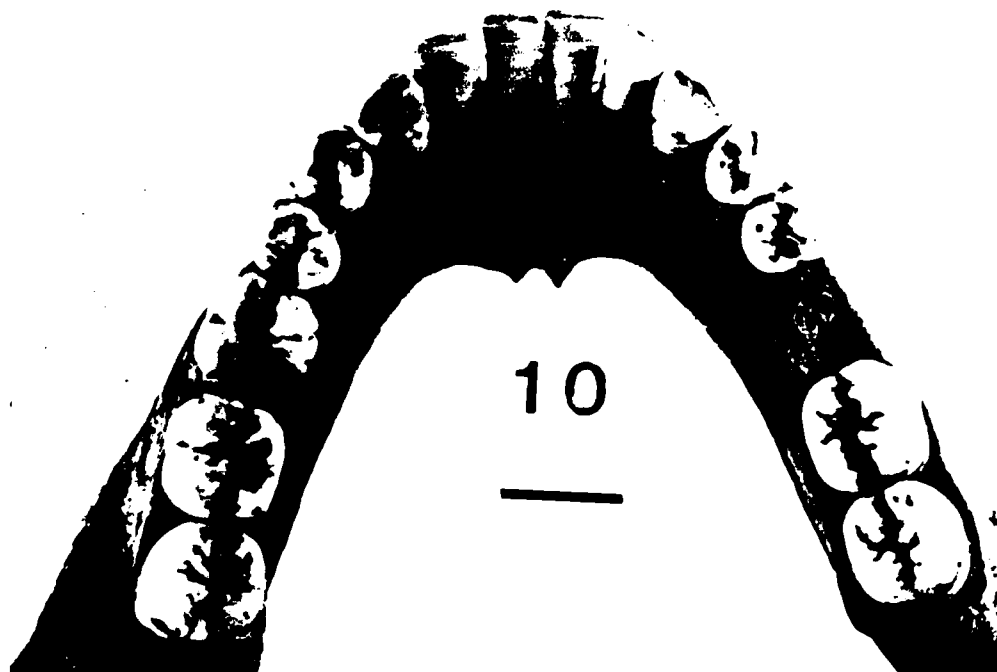


Figure 5-1 Mandibular dentition of Burial 10 showing premortem loss of right first molar and extensive decay of the left first molar. The bar under the burial number, in this and all subsequent photographs, represents one centimeter (AAS 832074).

Inventory: The cranium was complete, but the face was fragmented. A complete postcranial skeleton was recovered. Table AIV in the appendix provides a detailed bone by bone inventory of all the burials.

Paleopathology

Dental: The entire dentition was present. The maxillary dentition exhibited no pathologies, while eight caries were found on the mandibular teeth. The left first mandibular molar (Figure 5-1) was one quarter destroyed by decay, while the corresponding tooth had been lost pre-mortem probably due to decay. See Table AVIII in the appendix for quantitative data.

Infectious: The right tibia displayed well healed periostitis on the the lower lateral portion of the shaft. This lesion indicates a previous local infection probably related to trauma. The ribs displayed active periostitis on their pleural surfaces which reflect an active lung inflammation. Although this lesion has been associated with chronic pulmonary tuberculosis (Kelly and Micozzi 1983) other chronic lung infections cannot be ruled out because the characteristic spinal lesions of tuberculosis are absent.

Developmental: None.

Degenerative: The first metatarsal displayed a healed small circular cyst on the medial aspect of the proximal articular surface.

Neoplasm: None.

Traumatic: The first metacarpal of the right hand displayed sclerotic bone on the proximal articular surface which probably resulted from a previous dislocation.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE (first direction will always indicate the location of the skull). Various folk traditions stress that a person should be buried with the head to the west (Parler 1962:2880). One account states that "a person in the grave with his face facing north will not go to heaven" (Parler 1962:2881). Puckett (1926:94) states:

The graves are dug east and west and the head of the man laid towards the west. An old Mississippi grave digger informs me that this is always the case. A person should not sleep or be buried "crossways uv de world" and the head is towards the west, ("so de daid won't hab ter turn 'roun' when Gabr'l blows de risin' trumpet in de east"), although one collector cites cases of burials with the head to the east so that the dead will rise, attributing it to the star in the east at the Saviour's birth.

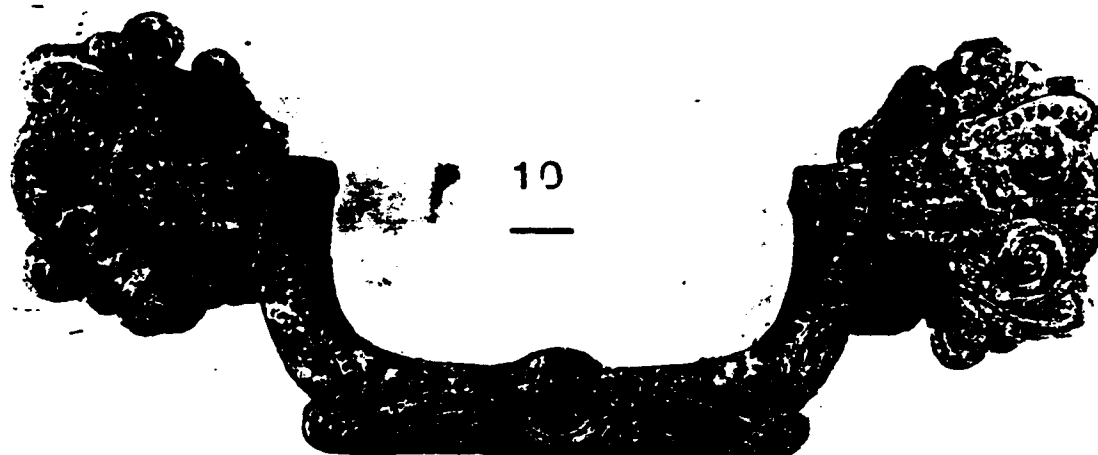


Figure 5-2 Swing bale casket handle with death heads from Burial 10 (AAS 832077).

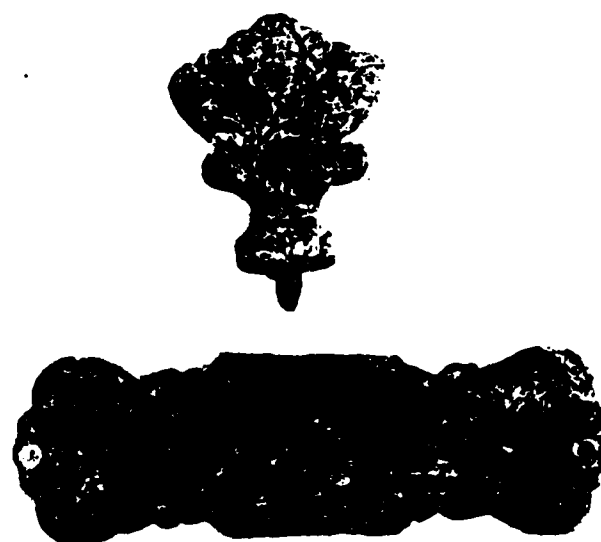


Figure 5-3 Lid fastener for casket from Burial 10 (AAS 832076).

Body Placement: Extended supine.

Hand Placement: Right arm over abdomen with right wrist over left elbow; left arm crosses pubis with left hand over right innominate.

Funerary Aspects

Casket Shape: Tapered toward head.

Casket Measurements: 221 cm long; 55 cm wide at top; 51 cm wide at center; 72 cm wide at foot.

Casket Hardware: Casket materials are listed in Table AXIV. The white metal handles exhibit stylized death's heads (Figure 5-2). Also present are lid fasteners (Figure 5-3). These are like ones with Burial 81. In Quad B a cast white metal plaque with the words "At Rest" was found; this is identical to the one found in Burial 70. The hardware found with this burial was also found with other ones in the area. As early as the mid-eighteenth century coffin makers in America could buy coffin furniture (i.e., decorations, plates, handles, etc.) for their trade (Habenstein and Lamers 1975:256-257).

CULTURAL CHARACTERISTICS

Clothing Components: Little diversity was observed in the artifacts collected (Table AXV). Buttons include bone and shell. It is difficult to date bone buttons, most of which were made from cow bone (Luscomb 1967:25). It appears that bone buttons were commercially made with four or five holes beginning in the early nineteenth century (Shepard 1981:83). Bone buttons were still available for purchase into the 1920s (Sears, Roebuck and Company 1929:184), and perhaps later. While shell buttons have apparently been produced for generations, the beginning of the American industry was ca 1887-1890 (Parmalee 1967:1) when a German pearlbutton maker immigrated to the United States and settled in Muscatine, Iowa. This became the center of the pearl button industry until ca 1955. Bone buttons were generally utilitarian, used for underwear and trousers (Luscomb 1967:25). Shell buttons were used for infant clothing, shirts, coats and other wear. The bone buttons found in the grave probably came from a pair of trousers, while the shell buttons were from a shirt. Wood studs were also found. Studs were used to fasten cuffs at the wrist; for men's vests; for ladies' shirtwaists; and to be inserted into the lapel (Luscomb 1967:191). Although wood examples are not shown, collar and cuff studs continued in use into the 1920s (Sears, Roebuck and Company 1929:526), and probably later. The presence of a metal cufflink suggests that the wood studs were associated with a collar or vest, probably the former. Metal cufflinks were used in the 1890s, and probably much earlier (Emmet 1969:171). The absence of other components of clothing may reflect aspects of folk traditions. For example, it was a common belief for both Whites and Blacks that one should never bury anyone with shoes left on the feet (Parler 1962:2855; Puckett 1926:84).

Nonpersonal and Related Goods: One clear glass patent medicine bottle was recovered within the coffin (Figure 5-4). The word "Pearl" was embossed into the bottom. Although no record was made of the location of the mold seam, it appears that it would have terminated at the lip. The use of clear glass probably postdates ca 1880-1890, while the mold seam location would suggest a post-1903 manufacture (Santeford 1981:63).

The presence of the bottle may relate to a tradition in which medicine bottles were placed upside down by graves with corks loosened so the medicine could soak into the grave (Puckett 1926:104). This was done in Mississippi and Alabama.

A footstone with the name "Conner" engraved on its surface was recovered during the 1980 overburden stripping and assigned to the Burial 10 grave shaft. However, Burial 10 could not be "Alex Conner", previously identified from the 1900 census, because Alex would have been at least 40 years old at death while Burial 10 was less than 30 years old.

PROPOSED BURIAL DATE

Most of the artifacts present were produced and utilized for a long period, often beginning in the early nineteenth century, or earlier, and were still used into the 1920s and later. The only artifact that suggests the burial was a twentieth century one is the clear patent medicine bottle, manufactured between ca 1903 and 1927, the date when the cemetery was no longer used.

BURIAL 14

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-34 years.

Sex: Female.

Race: Because of fragmentation of the face no metric genetic affiliation could be determined, but the nasal width and interorbital distance are suggestive of an African ancestry (Krogman 1962).

Preservation

Condition: Preservation was good and all skeletal elements were appropriately articulated.

Inventory: A complete skeleton was present, but the face, ribs, and some vertebrae had been fragmented.



Figure 5-4 Patent medicine bottle from Burial 10 (AAS 823716).

Paleopathology

Dental: The maxillary dentition was complete and exhibited seven caries, while the mandibular dentition had two molars lost premortem and exhibited a molar with the entire crown decayed.

Infectious: The left third and fourth ribs and the right third rib exhibited active periostitis along their pleural surfaces. Again as in the case of Burial 10, pulmonary tuberculosis is a possible diagnosis although other diseases cannot be ruled out.

Degenerative: The seventh thoracic vertebra exhibited a Schmorl's node which is caused by a herniated intervertebral disc. This condition is indicative of stress and trauma on the spine.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Left arm straight with left hand on pelvic area; right arm flexed with hand by the thoracic area.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 230 cm long; 52 cm wide.

Casket Hardware: This is listed in Table AXIV. There were six white metal coffin handles, three on each side. These were identical to those from Burial 29. The cast white metal lid fasteners are also identical to those from that burial. A cast white metal plaque with the words "At Rest" was found on the pelvic area, evidently placed within the casket. This is like the one from Burial 29.

One of the wood fragments from the casket exhibited red paint. This often appeared as a primer coat on fragments of wood from other burials.

CULTURAL CHARACTERISTICS

Clothing Components: The major artifacts found were shell buttons and snaps (Table AXV). Proposed dating for shell buttons is presented in the discussion of Burial 10. These may date from the 1889-1890s into

the 1950s, if American-made. No information could be found on the origin of snaps. Snaps are not shown in catalogs of the late 1890s (e.g., Emmet 1969; Israel 1968), but they are listed in 1902 as "invisible sew-on fasteners" (Amory 1969:947). From the description, it appears they were relatively new, gradually replacing hooks and eyes. By the 1920s, they are evidently accepted and are called "snap fasteners" (Sears, Roebuck and Company 1929:176).

Nonpersonal and Related Goods: One egg shell fragment was found in Quadrant A. The significance of the egg probably lies within folk tradition. One belief is that an egg should be buried with a person who has died under circumstances considered mysterious. By the time the shell had cracked within the grave, the true cause of death would have been discovered (David Jeane, personal communication). Eggs are often associated with other activities such as conjuring (Puckett 1926:241, 299) and goiter (Puckett 1926:374), as well as ideas of luck, wealth and sorrow (Puckett 1926:500-501). Parler (1962:2854) states that when a person drowned, Black Americans would often place a bowl on the thoracic area with an unbroken egg surrounded by a ring of salt. This was to keep the person's stomach from bursting open from the water that was swallowed.

PROPOSED BURIAL DATE

There are few artifacts present that provide positive insights on the period of burial. The presence of shell buttons suggests a date, while the snap fasteners may indicate a post-1900 date. It is proposed that the burial dates ca 1900-1927, and that it was approximately contemporaneous with Burial 19. The latter is based on the similarity of casket hardware.

BURIAL 15

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Male.

Race: No morphological or metric indicators of genetic affiliation were obtained.

Preservation

Condition: Preservation was good but considerable disarticulation occurred. This burial exhibited the typical thoracic disarticulation of vertebrae, ribs, and shoulders frequently observed at the Cedar Grove Cemetery (Figure 5-5). There are a number of explanations for this phenomenon including: rodent activity, casket collapse, water

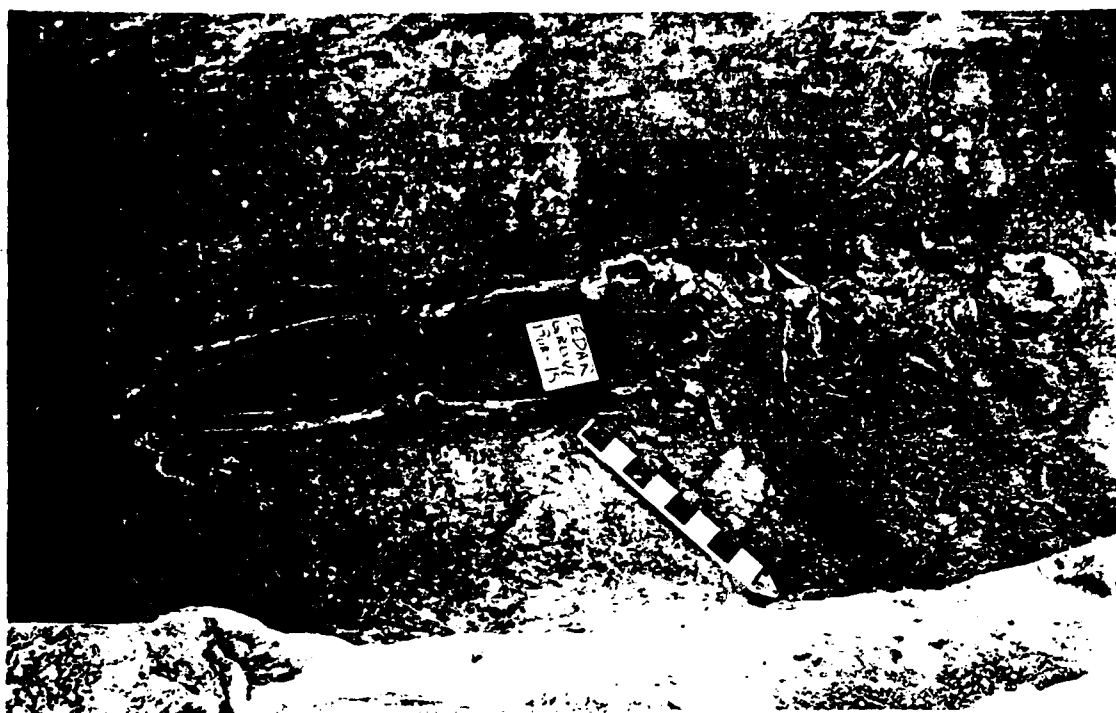


Figure 5-5 Full length view of Burial 15 showing the thoracic disturbance typical for Cedar Grove adults (AAS 823578).



Figure 5-6 Occlusal view of mandibular dentition of Burial 15 showing gold crown on the second premolar and filling on the right central incisor (AAS 832092).

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CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY

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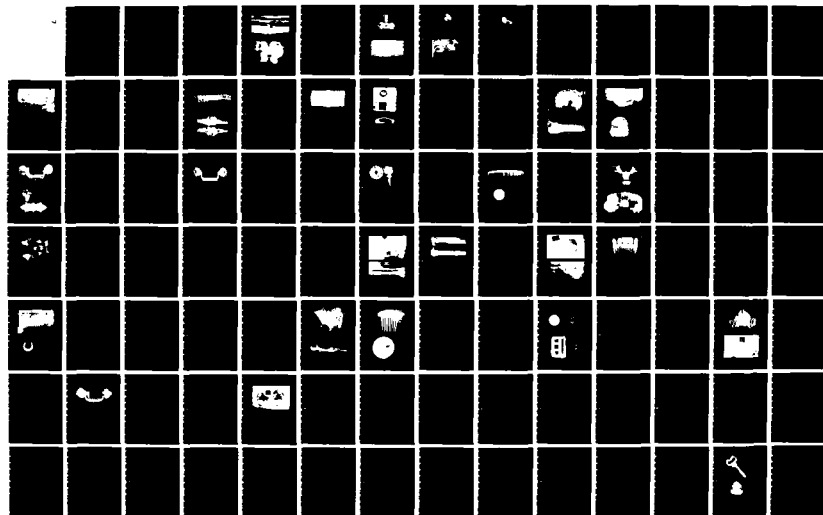
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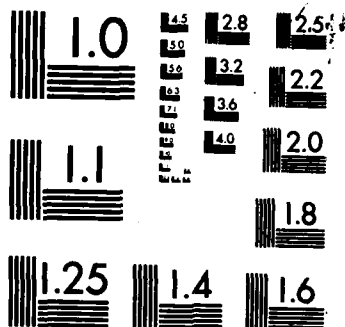
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action, body shifting during decomposition, and natural process of decay. A complete bone by bone study of all burials is required before this phenomenon can be understood.

Inventory: A complete cranial and postcranial skeleton was present although the face, some vertebrae, and all ribs were fragmented.

Paleopathology

Dental: The maxillary dentition was not missing any teeth and three caries were observed. One molar was missing premortem from the mandible and nine caries were observed. The labial carie on the right central incisor had been filled and the second premolar had a gold crown (Figure 5-6).

Infectious: The right radius showed a remodeled patch of periostitis on the shaft just superior to the inferior metaphysis. Both the left tibia and fibula showed healed periostitis over most of the shafts with the most severe expression near the midshaft. The shaft expansion at this point on both bones suggests a healed fracture with an associated secondary infection (Figure 5-7). The presence of a fracture cannot be established without radiographic examination. The right tibia and fibula show similar lesions, but much less pronounced.

Developmental: The right orbit showed healed porotic hyperostosis, while the calvarium showed extensive remodeled pitting. These lesions are usually indicative of previous experience with iron deficiency anemia resulting from poor diet, but the influence of the sickle cell complex must be considered.

Degenerative: Thoracic vertebrae 8-12 and all lumbar vertebrae exhibited Schmorl's nodes indicative of herniated discs (Figure 5-8). This condition suggests severe back stress and trauma. Both right and left navicular bones and tali of the feet showed lipping of the articular surfaces.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Orientation: Extended supine.

Hand Placement: Arms folded around waist; hands not crossed.

Funerary Aspects

Casket Shape: Tapered toward feet. . .

Casket Measurements: 224 cm long; 66 cm wide at top; 58 cm wide at center.

Casket Hardware: Casket components are listed in Table AXIV. The cast white metal handles recovered are like those from Burial 29. Six handles were recovered, with three along each side of the casket. Ornate lid fasteners were also recovered (Figure 5-9). Relatively undecorated lid fasteners, identical to those from Burial 29, were also collected. It appears that these fasteners were probably used on an exterior box, while the more ornate ones were used on the casket. During the nineteenth century attempts were made to line the graves with rock, stone, or brick to separate the body from the earth around it (Habenstein and Lamers 1975:292). Common coffin boxes of wood were also used. These eventually evolved into the concrete vault which came into prominence shortly after 1900 (Habenstein and Lamers 1975:296).

Above the arms, perhaps on the lid of the casket, was a cast white metal plaque with the words "At Rest" (Figure 5-10).

CULTURAL CHARACTERISTICS

Clothing Components: The primary artifacts collected were bone and shell buttons (Table AXV). These types of artifacts were discussed for Burial 10. The bone buttons have four holes drilled through a concave center. These buttons were probably associated with trousers, shirts, and perhaps underwear. One badly rusted metal button with a raised area on the back was also collected. Only one bone stud was found in the cranial area (Figure 5-11). Studs were used in the 1880s and continued well into the 1900s (see Burial 10 for discussion).

Snap fasteners were also recovered. These are discussed under Burial 14; they would appear to have become popular post-1900.

A pair of gold filled cufflinks were found by the left wrist (Figure 5-12). Similar cufflinks are shown in the 1897 Sears, Roebuck catalog (Israel 1968:424-425) and the 1895 Montgomery Ward and Company catalog (Emmet 1969:170-171). Another possible cufflink was found by the right wrist (Figure 5-13). This white metal artifact exhibited a small ball attached to the decorated portion by a curved bar.

Grooming and Related Items: One gold cap was found on the second premolar from the right side of the mandible.

PROPOSED BURIAL DATE

There are few artifacts that allow a specific determination of period of burial. Presence of shell buttons and snap fasteners suggests

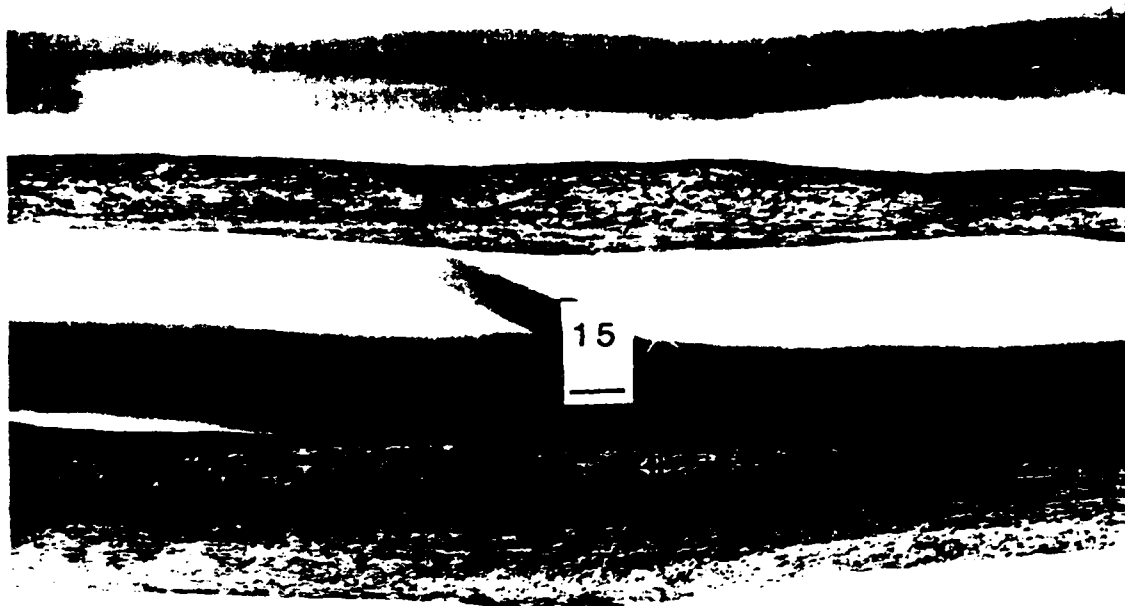


Figure 5-7 Tibia and fibula of Burial 15 showing healed periostitis and shaft expansion associated with a possible fracture (AAS 823778).

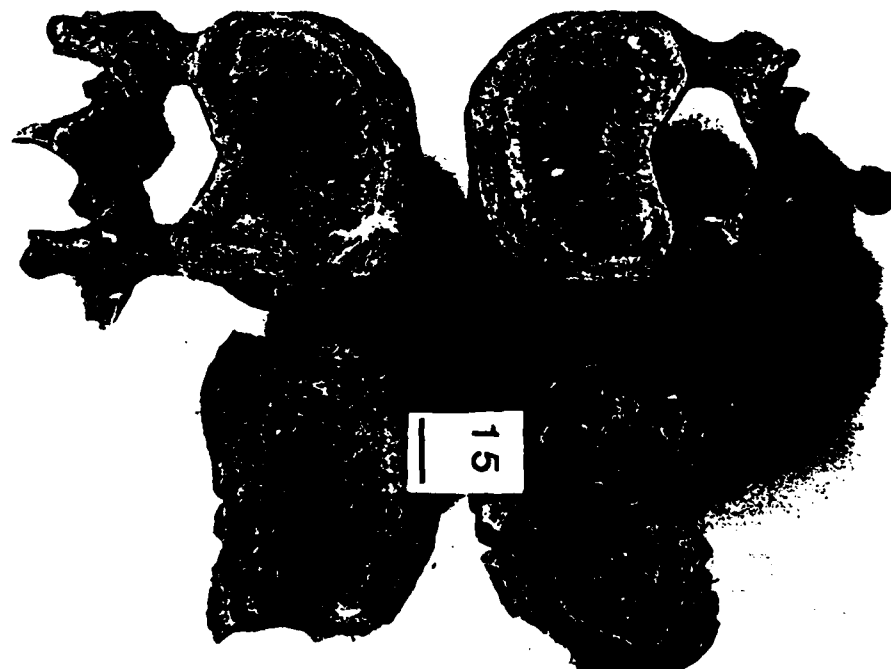


Figure 5-8 Vertebrae from Burial 15 showing Schmorl's nodes on body surfaces (AAS 823781).

a probable post-1890s or 1900s burial. Since the cemetery was no longer used after ca 1927, the burial predates that year.

BURIAL 16

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 3.5 ± 1 year.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair with the grave shaft, right humerus, and right tibia and fibula disturbed by the 1980 backhoe trench.

Inventory: The skeleton is nearly complete with the skull, vertebrae, and ribs fragmented. The right ulna was missing, while the right humerus, tibia, and fibula were only partially preserved. All hands and feet were represented although only partially.

Paleopathology

Dental: All deciduous teeth were present with no pathological lesions.

Infectious: The tibiae, left radius and ulna exhibited active periostitis, while the femora and fibulae were striated and pitted. These lesions indicate active systemic postcranial infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: SE-NW and thus opposite usual orientation.

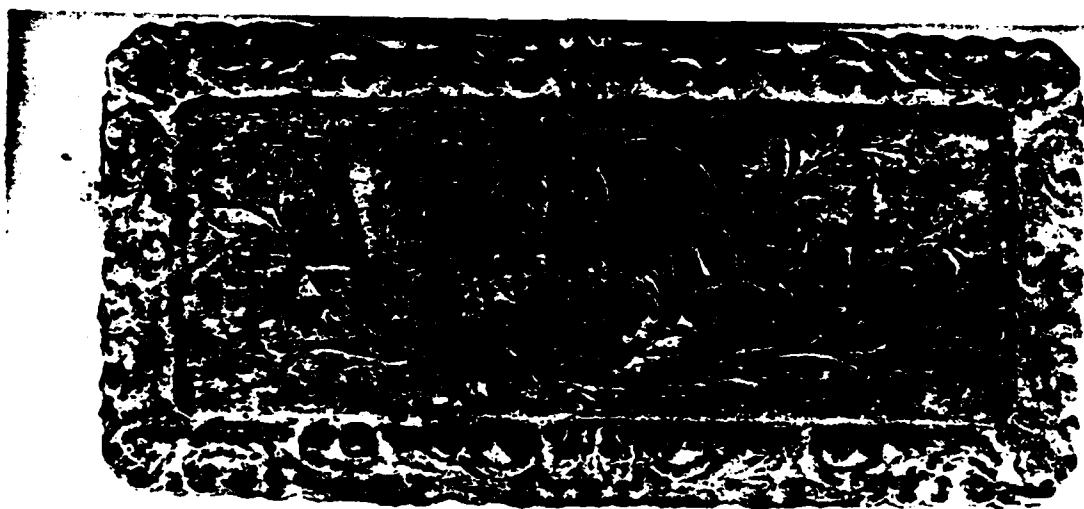
Body Placement: Extended supine.

Hand Placement: Arms straight down with hands resting along pelvis on each side of body.



15

Figure 5-9 Lid fastener from casket of Burial 15 (AAS 832095).



15

Figure 5-10 Plaque from casket of Burial 15 (AAS 823856).



15

Figure 5-11 Bone collar stud from Burial 15 (AAS 823857).

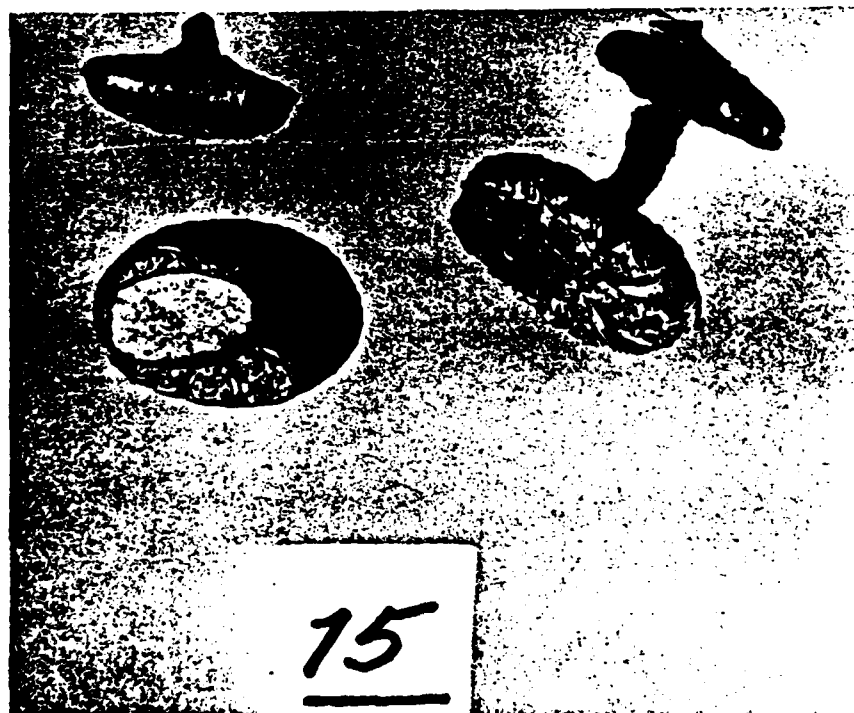
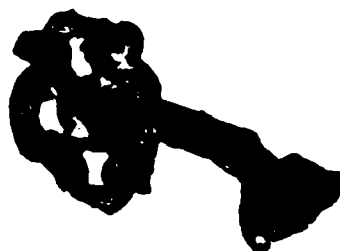


Figure 5-12 Gold filled cufflinks from Burial 15 (AAS 823855).



15

Figure 5-13 Possible cufflink from Burial 15 (AAS 823854).

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: See Table AXIV. This consists of nails and lining tacks.

CULTURAL CHARACTERISTICS

Clothing Components: Two shell buttons with two holes through concave centers were collected (Table AXV). These probably were from a shirt or some type of dress or gown. Dating information is presented with Burial 10, but the buttons probably postdate ca 1890.

Nonpersonal and Related Goods: One prehistoric pottery sherd was collected (Table AXVI). Its presence in the grave is most likely fortuitous.

PROPOSED BURIAL DATE

The only artifacts suggesting date of interment are the shell buttons. These suggest a post-1890 to ca 1927 (date when the cemetery was no longer used) period of death.

BURIAL 17

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 13 months \pm 6 months. The development of the maxillary dentition yields an age of 18 months, while the mandibular teeth yield an age of 9 months. This disparity in dental development may indicate a pathological condition such as rickets, although no other skeletal indicators are present. Comparison of long bone lengths to age (Ubelaker 1978:48-49) suggest greater correspondence to the 18 month age.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair with extensive disturbance caused by previous backhoe work.

Inventory: The cranium, ribs, and vertebrae were complete but fragmented, while all postcranial bones except the fibulae were complete. The hands and feet were represented by only a few fragments.

Paleopathology

Dental: The erupted deciduous teeth exhibited no pathology other than incongruous eruption pattern.

Infectious: Both right and left rib three exhibit active periostitis which suggests chronic pulmonary infection such as tuberculosis.

Developmental: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms probably extended along side of body with hands along pelvis on each side of the body.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 82 cm long; 17 cm wide at top; 28 cm wide at center; 14 cm wide at foot.

Casket Hardware: This included only nails and lining tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three white porcelain buttons were collected beneath the vertebral column (Table AXV). Porcelain buttons have been made for several centuries, but it was not until nearly the nineteenth century that these were made for trade (Luscomb 1967:156). It is difficult to date these buttons except in broad periods of fashion based on decoration. The buttons present with the burial could have been produced from the 1800s into the 1920s or later. Shoe or boot heels were found by each foot. One of these appeared to be composed of layers of leather and another substance possibly rubber, with small nails. Rubber appeared in shoes around the mid-nineteenth century as a small protruding insert in an otherwise all leather heel (Anderson 1968:59). The all rubber heel appeared in 1895. While shoe soles and

heels were nailed to uppers by hand previous to 1862, not until that time were nailing machines developed (Anderson 1968:61). Most heels are still nailed to shoes. The technological aspects of the heels recovered would not contradict a post-1890s period of burial. If the shoes were present on the feet during burial, the pattern would appear to be inconsistent with folk traditions. Parler (1962:2855) observes that one Arkansas belief is that one should never bury the dead with shoes left on the feet. The presence of a brass safety pin and a fragment of coarse white fabric on the left innominate may indicate that the child was buried with a diaper. The safety pin provides no potential for dating, since the artifact has remained virtually unchanged from the 1890s (Emmet 1969:87; Israel 1968:322) to the present.

PROPOSED BURIAL DATE

As a result of the examination of the artifacts present, it is proposed that this individual could have been buried anytime between ca 1890 and 1927.

BURIAL 18

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 10 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with the right arm and leg disturbed by the 1980 backhoe trench.

Inventory: The skull was represented by only fragments of the occipital, parietals, and temporals. The ribs and vertebrae were present as fragments. The right arm and tibia were missing and the remaining postcranial elements were fragmented. The hands and feet are represented by only a few fragments.

Paleopathology

Dental: No lesions observed on the dentition.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along side with hand resting on ilium
one arm missing.

Funerary Aspects

Casket Shape: Tapered toward head.

Casket Measurements: 83 cm long; 12 cm wide at top; 19 cm wide at
foot.

Casket Hardware: This included only nails and lining tacks (Table
AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two porcelain buttons with four holes through a
concave center were collected (Table AXV). See Burial 17 for infor-
mation on dating. A fragment of white cloth with a safety pin was
found on the left innominate. These are probably the remains of a
diaper with safety pin closure. See Burial 17 for a similar situation
and dating information.

PROPOSED BURIAL DATE

It is proposed that this child could have been buried anytime be-
tween ca 1890 (and perhaps somewhat earlier) and 1927. The artifacts pre-
sent do not provide diagnostic information to determine a specific date
of interment.

BURIAL 19

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 8 ± 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation with complete disarticulation of the skeleton (Figure 5-14). This was the most completely disarticulated of all the Cedar Grove burials and even long bones had been moved. The fact that the right tibia and fibula were still together indicates that the bones still had cartilage preserved when this event occurred.

Inventory: With the exception of the right innominate the entire cranial and postcranial skeleton was present although in many cases individual bones were fragmented.

Paleopathology

Dental: There were two caries in the deciduous maxillary teeth, while the maxillary teeth exhibited seven caries.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with elbows flexed; hands crossed at lower thoracic area.

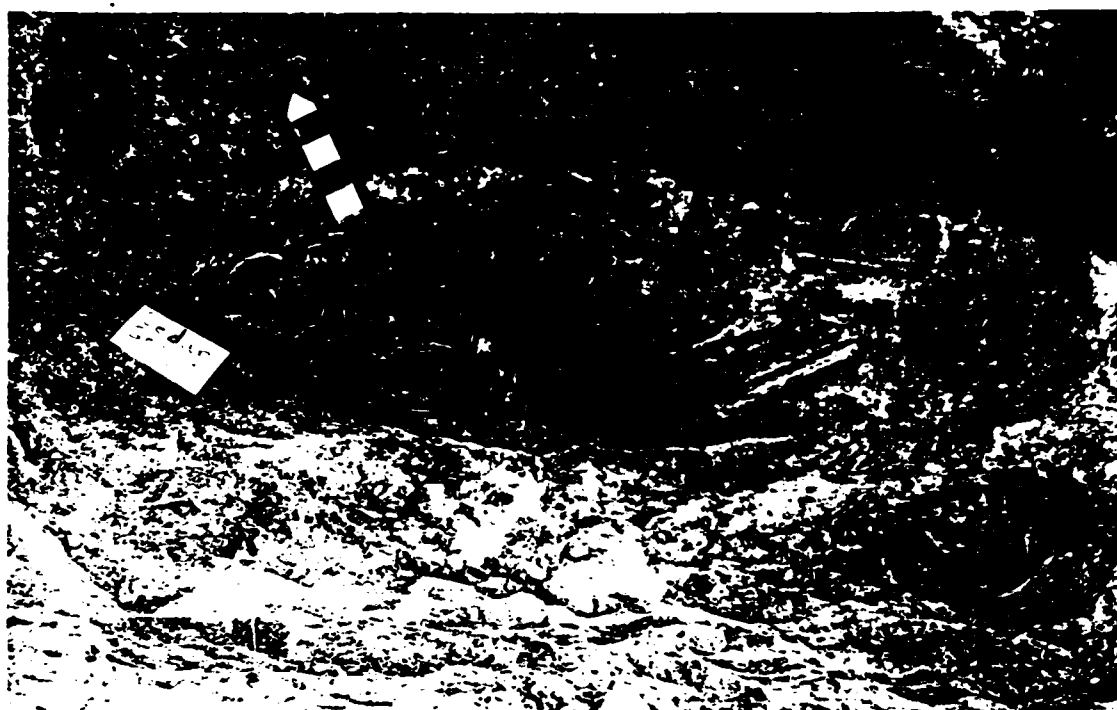


Figure 5-14 Full view of Burial 19 showing almost complete disarticulation (AAS 823395).

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 141 cm long; 25 cm wide at top; 55 cm wide at greatest width; 33 cm wide at foot.

Casket Hardware: Only nails and one diamond tack were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two porcelain buttons with four holes through a concave center were found (Table AXV). Dating information is presented for Burial 17, suggesting a ca late 1800s to 1920s or later period of manufacture. These buttons were from a shirt or dress on the child.

PROPOSED BURIAL DATE

There are few artifacts to provide specific insights on the date of burial. It is proposed that it could have been anytime between ca 1890s and 1927.

BURIAL 21

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 55+ years.

Sex: Female.

Race: Broad interorbital width, wide nasal breadth, and the presence of nasal gutter all suggest an African ancestry (Krogman 1962).

Broken zygomatics prevented metric determination of genetic affinities.

Preservation

Condition: Excellent preservation with extensive disarticulation of the thorax region as well as at the knees.

Inventory: Complete cranial and postcranial skeleton with fragmentation only of the ribs.

Paleopathology

Dental: A total of six teeth were lost premortem from the maxillary dentition, while two caries were observed. Only one tooth was lost premortem from the mandible, while eight caries were observed.

Infectious: Both femora exhibited remodeled striations and pits, while the left tibia and both fibulae showed remodeled periostitis. The right tibia had partially remodeled periostitis on the posterior portion of the shaft. These lesions indicate an infection of the lower limbs in the process of healing.

Developmental: None.

Degenerative: All vertebrae showed extensive osteophytosis with the thoracics more involved on the right side (Figure 5-15). The thoracic 12 and lumbar 1 vertebrae were fused together. Extensive osteoarthritis was found involving the knee joint (Figure 5-16). The carpals and metacarpals of the hand as well as the tarsals and metatarsals of the feet showed extensive osteoarthritic deterioration. These lesions are indicative of advanced age and a strenuous life style.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with hands resting on pubic area; hands are not crossed.

Funerary Aspects

Casket Shape: Tapered toward head.

Casket Measurements: 195 cm long; 42 cm wide at top; 47 cm wide at center; 50 cm wide at foot.

Casket Hardware: Cast white metal casket handles like those with Burial 97 were collected (Figure 5-17). Cast white metal casket lid fasteners like those found with Burial 70 were also found (Table AXIV). In addition, an iron thumbscrew of 6.4 mm thick wire was recovered. This may have been used to secure the lid of an outer burial box, but there was no additional evidence of such a casket receptacle. Some of the wood fragments exhibited a red priming paint with white paint overlying this. Several fragments of a metal plaque with the words "At Rest" was found at the waist area. Other coffin components include diamond tacks, nails, lining tacks, and staple.



Figure 5-15 Anterior view of vertebral column of Burial 21 showing extensive osteophytosis (AAS 832123).

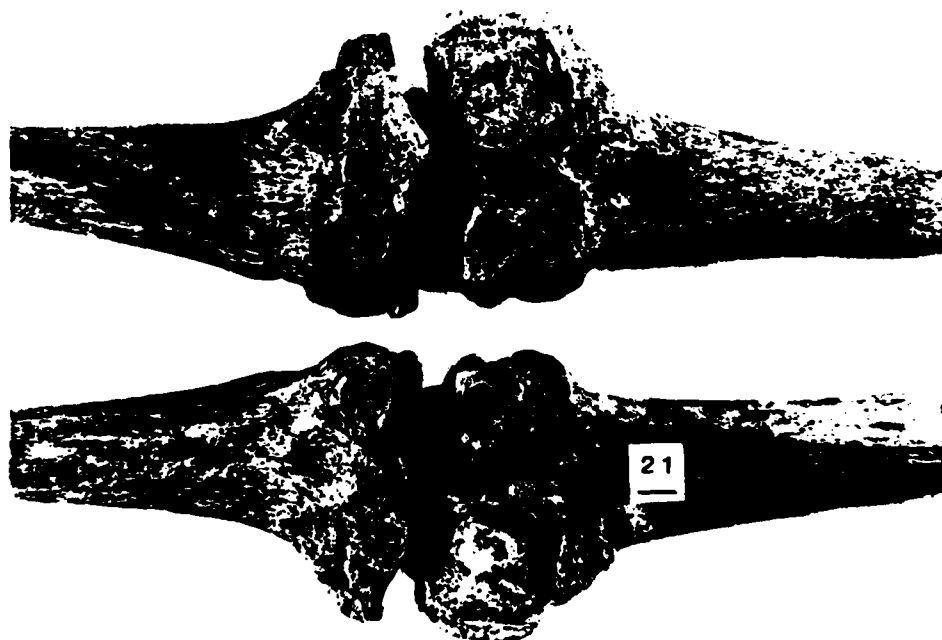


Figure 5-16 Posterior view of knee joint of Burial 21 showing extensive osteoarthritic lipping (AAS 832121).

CULTURAL CHARACTERISTICS

Clothing Components: Very few artifacts were found. One large white porcelain button with four holes through a concave center was collected (Figure 5-18). This may have been from a blouse. Dating information is the same as provided for Burial 17. Three brass snaps covered with fabric were found that may have been associated with an article of clothing, such as a blouse or skirt (Table AXV). Information on the dates of snap fasteners is the same as presented for Burial 14. About three-quarters up the femura and between the legs was a brass safety pin (Figure 5-19). Dating information is provided in Burial 17. Other cultural material recovered were pieces of black fabric within the casket. No date is proposed for these artifacts.

Nonpersonal and Related Goods: Three fragments of what appeared to be egg shell were found in the cranial area. The possible uses of eggs are discussed in Burial 14.

PROPOSED BURIAL DATE

None of the artifacts present provide specific enough information to permit dating of the burial. Information contained in catalogs suggests that snap fasteners became more popular post-1900, suggesting that the burial may date ca 1900-1927. None of the other artifacts would contradict this interpretation.

BURIAL 24

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Male.

Race: The fragmentary skull precluded morphological and metric observations of genetic affinity.

Preservation

Condition: Fair with typical disturbance of the thorax.

Inventory: The skeleton was complete with fragmentation of the cranium, face, vertebrae, ribs, scapulae, innominates, and left tibia and fibula.

Paleopathology

Dental: The maxillary dentition had one carie, while two were found in the mandibular dentition.



29

Figure 5-17 Casket handle with Burial 21 (AAS 832146).

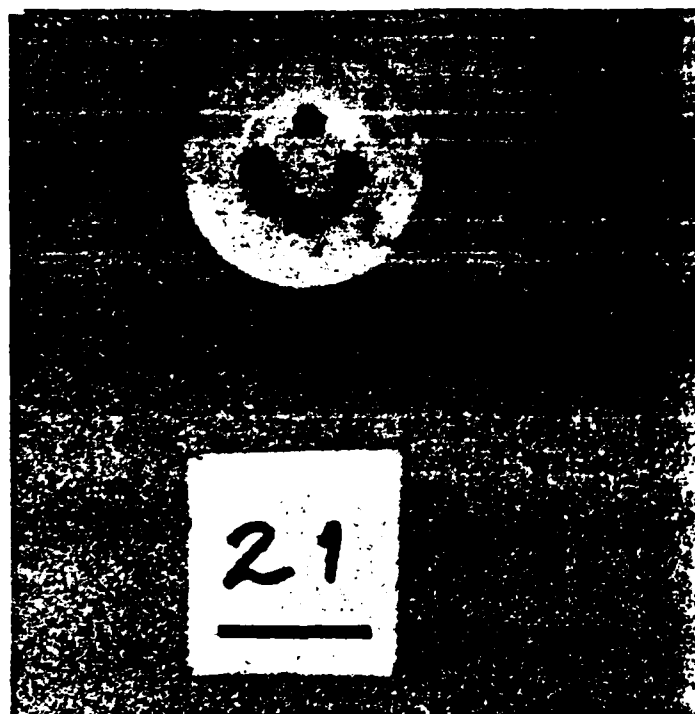


Figure 5-18 Porcelain button with Burial 21 (AAS 823425).



21

Figure 5-19 Safety pin with Burial 21 (AAS 823427).

Infectious: Both tibia shafts were medially expanded, bowed, and exhibit healing periostitis. The left fibula also exhibited healing periostitis. These lesions indicate a lower limb infection in the process of healing.

Developmental: The orbits exhibited healed cribra orbitalia, while the cranium showed an expanded diploe (Figure 5-20) and remodeled porotic hyperostosis. This lesion is typical of adults recovering from an early case of iron deficiency anemia of dietary origins. At this cemetery the influence of sickle cell trait cannot be ignored.

Degenerative: The thoracic vertebrae 7-12 showed small Schmorl's nodes, while the superior surfaces of the lumbar vertebral bodies showed surface irregularities. These lesions are indicative of severe back stress.

Neoplasm: None.

Traumatic: The left femur showed a large mass of ossified soft tissue 2.1 cm below the lesser trochanter in the area of muscle attachment (i.e., M. vastus medialis, M. adductor brevis, M. pectineus). This lesion (Figure 5-21) probably resulted from trauma and subsequent ossification of cartilage and hemorrhage. Further diagnosis must await histological examination. A resemblance to the famous Java Homo erectus femur from the Trinil beds should be noted. The Java specimen is diagnosed as traumatic myostosis ossificans (Ortner and Putschar 1981:85).

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along sides; elbows slightly bent; hands crossed over pubis with right hand atop left hand.

Funerary Aspects

Casket Shape: Tapered toward head to roughly rectangular.

Casket Measurements: 200 cm long; 41 cm wide at top; 36 cm wide at center; 46 cm wide at foot.

Casket Hardware: Casket components are listed in Table AXIV). Four ornately decorated cast white metal swing bail handles from the casket were found (Figure 5-22). Three plain handles of cast iron which were painted black were also found (Figure 5-23). Mr. Nelson, of Nelson's Funeral Home in Fayetteville, identified these as handles for an exterior box which received the casket. It appears that since colonial times some box or container was used to enclose and protect

both the body and the casket (Habenstein and Lamers 1975:299). This box was often made of wood, and up to ca 1875 was buried simply to get rid of it. With increased concern for protecting the body from beasts or elements, the wooden box became outmoded in time. The peak use was during the period when the metallic vault was introduced, but before the rise of the concrete burial vault early in the twentieth century (Habenstein and Lamers 1975:305). The use of a wooden receptacle cannot be used to determine the date or period of burial. The use of a wooden rather than a concrete vault may reflect local retention of earlier customs, economic conditions, or other factors.

Lid fasteners were also found. A number of these were identical to those found with Burial 77, while ones of another pattern were like those from Burial 29. These may be fasteners for the casket and an outer box vault.

CULTURAL CHARACTERISTICS

Clothing Components: Buttons include four shell ones, and two of what appears to be a synthetic material (Table AXV). These were found in a portion of the burial that suggest they were shirt buttons. One shell button had two holes through the center, while others had four holes through a concave central portion. Dating information is provided in Burial 10. The buttons of synthetic material have four holes through the concave center. One is black while the other is off-white. The ancestor of modern synthetic plastics is celluloid, first made in the United States in 1868 or 1869 (Cherry 1967:18; Luscomb 1967:154). This material appears to have been used during the 1870s and 1880s (Crummett and Freeman 1969:76). It was not until the discovery of Bakelite around 1907 or 1909 that the real foundation of plastics was laid, and most expansion occurred in the 1930s. Between 1909 and 1926 cold-molded and case in plastics were also developed. It is possible that the buttons are from the 1890s, or somewhat later. The type of plastic was not identified.

One bone stud was found, which may have been used to secure a collar. It appears that cuffs were secured with one piece brass cufflinks collected at the site. These look much like studs used for collars with a metal disc connected by a short column of metal to a disc of smaller diameter. These are similar to the bone stud from Burial 15 (Figure 5-11).

One eyelet was found, but there is no other evidence to suggest that shoes were present in the burial. Use of this artifact and period of manufacture are indeterminate.

PROPOSED BURIAL DATE

Few artifacts are present beyond casket components. The buttons found with the burial suggest that burial probably occurred sometime between ca 1890 and 1927. Although lid fasteners are like those from Burials 29 and 77, it cannot be assumed these burials were contemporaneous. The casket maker may have retained hardware of a particular

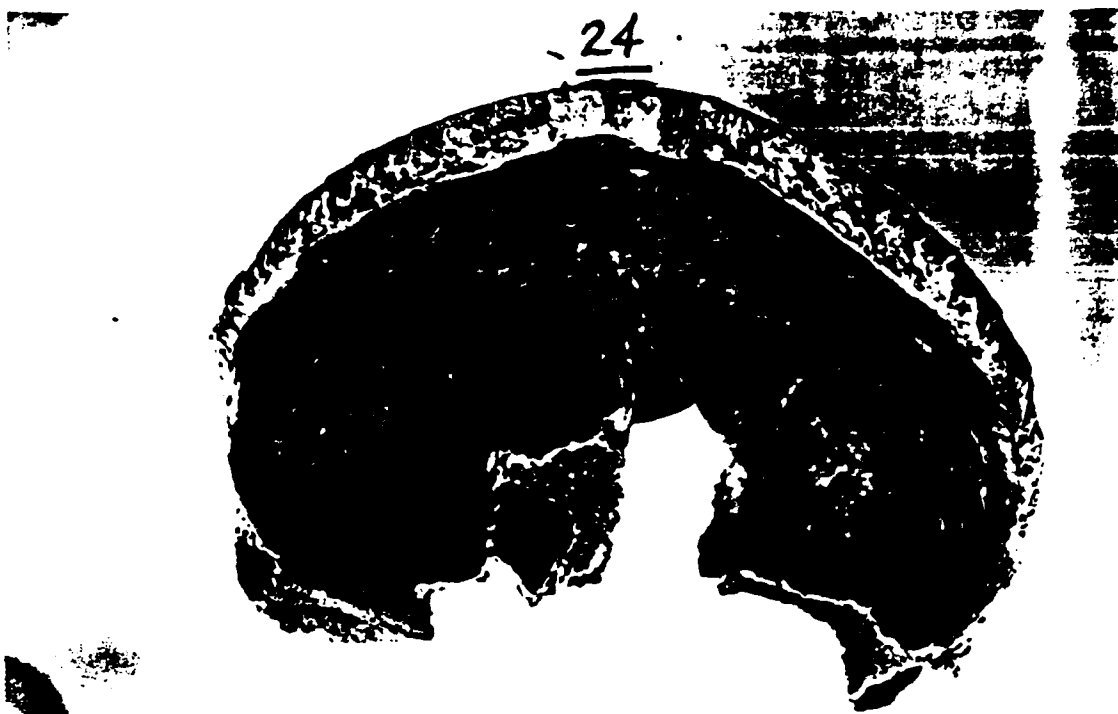


Figure 5-20 Posterior view of frontal bone from Burial 24 showing expanded diploe (AAS 823404).

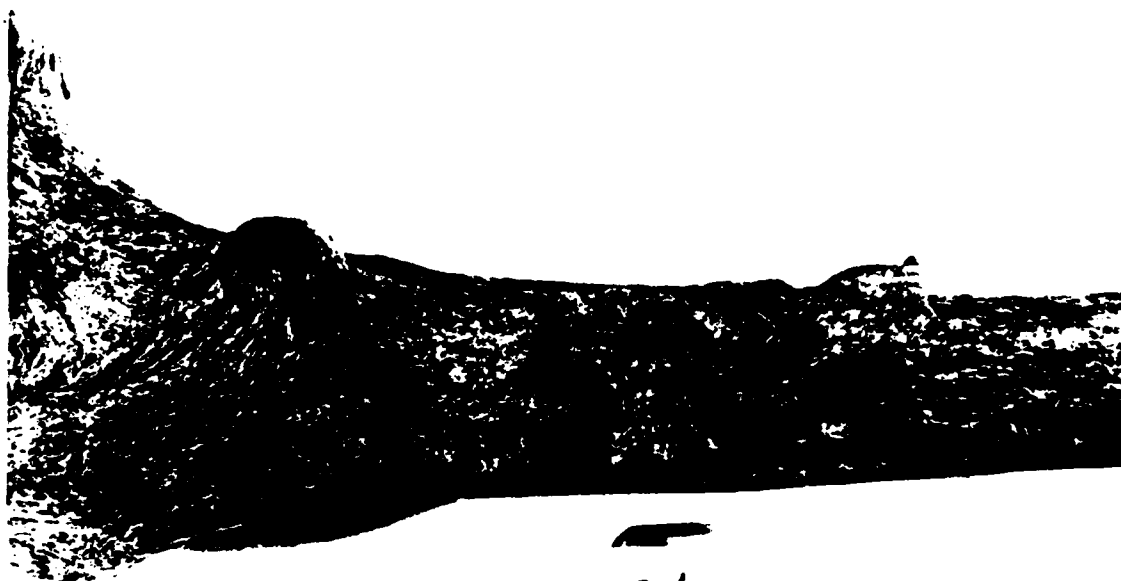


Figure 5-21 Posterior view of the left femur of Burial 24 showing mass of irregular ossified tissue (AAS 832137).



Figure 5-22 Swing bale casket handle from Burial 24 (AAS 823433).



Figure 5-23 Casket receptacle box handle from Burial 24 (AAS 823434).

pattern for a long period, or the styles of handles and fasteners may have remained popular a long time.

BURIAL 25

BIOLOGICAL CHARACTERISTICS

This burial contained possible twins labeled A and B and are considered separately.

BURIAL 25A

Demographics

Age: 7 months \pm 2 months in utero and thus are probably stillborn.

Sex: Unknown

Race: Unknown.

Preservation

Condition: Fair preservation and normal articulation.

Inventory: The skull was fragmented and incomplete as were the hands and feet. The major bones of the postcranial skeleton were complete.

Paleopathology

Dental: Normal dental development.

Infectious: Mild unremodeled periostitis was observed on scapulae, humeri, femora, and fibulae. These lesions are indicative of beginning systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

BURIAL 25B

Demographics

Age: 7 months \pm 2 months in utero.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and normal articulation.

Inventory: The skull, hands, and feet were badly fragmented, while the major bones of the postcranial skeleton were complete.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis was observed on the scapulae, humeri, radii, ulnae, pelvis, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along sides with hands on pelvis.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 35-40 cm long; 30-32 cm wide.

Casket Hardware: Nails and a fragment of a steel or iron band (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: This burial contained what appeared to be infant twins. The only clothing components were brass safety pins in the pelvic areas of each infant. Information on dating is provided in Burial 17. These were probably used to secure diapers. One common

straight pin was also collected, but its use was not determined. The modern type of pin made by machine was produced about 1800, with the flat-headed pin merchandised ca 1830 (Andere 1971:47).

BURIAL 29

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-39 years.

Sex: Female.

Race: Unknown.

Preservation

Condition: Good preservation despite the loss of one quarter of the skeleton into the Red River due to bank collapse. The legs were disarticulated at the knees.

Inventory: The following skeletal components were recovered: mandible; cervical vertebra 5; thoracic vertebrae 8, 11, and 12; all lumbar vertebrae; scapulae; right clavicle; right humerus; ulnae radii, pelvis; legs; hands; and feet.

Paleopathology

Dental: Three teeth were lost premortem and two caries were observed.

Infectious: Just posterior to the mental foramen of the mandible is a small patch of healed periostitis. The shafts of the femora, tibiae, and fibulae exhibited remodeled striations and pits indicating a prior infection of the legs.

Developmental: None.

Degenerative: The glenoid fossa of the left scapula had a small oval depression spanned by an osseous spicule.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

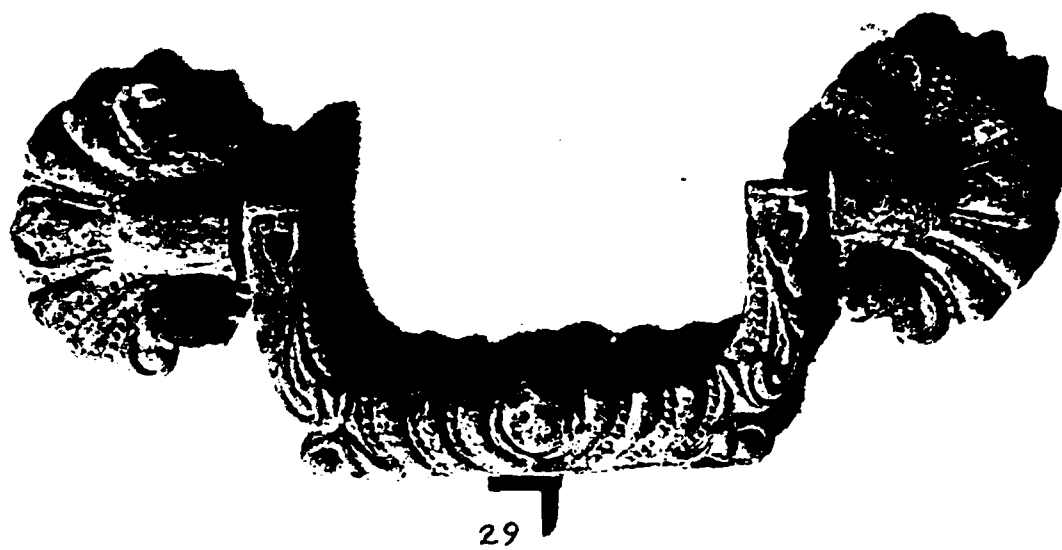


Figure 5-24 Casket handle from Burial 29 (AAS 823848).

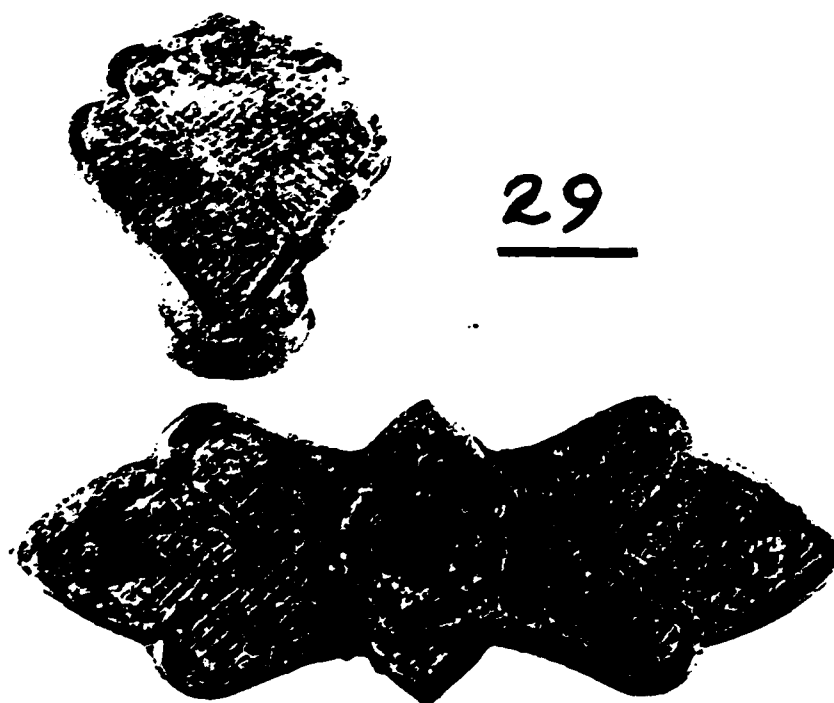


Figure 5-25 Casket lid fastener from Burial 29 (AAS 832145).

Body Placement: Extended supine.

Hand Placement: Disturbed; right arm bent at elbow with hand resting on the left ilium.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Length was indeterminate; 62 cm wide.

Casket Hardware: Considerable components were found. Five casket handles were found (Figure 5-24). These were well ornamented like those from Burials 70 and 77, but exhibited a different pattern. They are made of cast white metal, and are of the swing bail type. Five lid fasteners were found which exhibited a cross-hatched pattern (Figure 5-25). One fastener or thumbscrew varies from the others and may have been associated with an outside box, although there is no additional evidence of such a vault. A metal plaque with the words "At Rest" was found on the abdominal area (Figure 5-26). This cast white metal plate is similar to those found with other burials. Other casket hardware includes nails, diamond tacks, and lining tacks (Table AXIV). Wood fragments were found and there was evidence of red paint on these.

CULTURAL CHARACTERISTICS

Clothing Components: Only one shell button was found (Table AXV).

Dating information is presented with Burial 10. This could date to ca 1890 into the 1950s. A faceted black piece of glass was found by the right hand area (Table AXVI). A small hole is bored through it indicating that it was attached to something. Around 1853 women wore jet (black anthracite coal) brooches, bracelets, beads, fringe and buttons (Crummett and Freeman 1969:80). These articles called buttons were generally small dangling pieces from jewelry (Luscomb 1967:111). Vulcanite most nearly approaches the look of jet and was often used as a substitute. Jet jewelry was still available during the 1890 - early 1900s period (Amory 1969:90; Emmet 1969:179; Israel 1968:431), while black faceted glass buttons can still be purchased. Buttons identical to the one found with the burial are shown in the 1895 Montgomery Ward catalog as Black Ball cut jet dress buttons (Emmet 1969:84). While black glass buttons were often called jet, this refers to the color of the glass and not to the material.

Fragments of brass safety pins were found, but use is indeterminate. Two snap fasteners were found (Table AXV). One of these was attached to a fragment of black or brown fabric of coarse weave. This may have been part of a dress.

Nonpersonal and related goods: Prehistoric artifacts were found in the grave, but their presence is probably fortuitous (Table AXVI).

PROPOSED BURIAL DATE

There are few artifacts that are diagnostic and permit specific dating of the burial. The presence of shell buttons suggests a post-1890s burial, while snaps would seem to indicate a post-1900 date since these became more popular during the early twentieth century. It is therefore proposed that interment was ca 1900-1927.

BURIAL 31

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-34 years.

Sex: Female.

Race: The presence of alveolar prognathism, nasal gutter, broad nasal aperture, and frontal bossing all suggest an African ancestry (Krogman 1962). Using the multivariate cranial formula for females developed by Giles and Elliot (1962) places this individual just across the Black-Indian cut off into the Indian range. Although this position is not outside the range of variation in the original sample (Giles and Elliot 1962) it might suggest Black-Indian admixture. (See discussion of genetic affiliation in Chapter 6.)

Preservation

Condition: Excellent preservation with no evidence of disarticulation.

Inventory: A complete cranial and postcranial skeleton was present.

Paleopathology

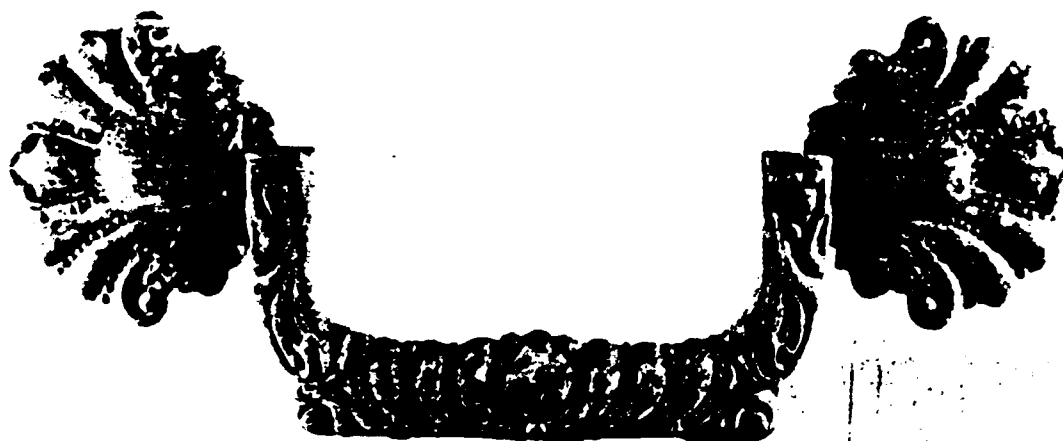
Dental: One maxillary tooth (right I₁) was lost premortem and three caries were recorded. Four caries were observed on the maxillary dentition.

Infectious: The right tibia displayed small areas of partially healed periostitis, while the right fibula was striated. The left tibia and fibula exhibited expansion of the cortex, patches of healed periostitis and striations of the cortex. These lesions indicate a healing infection of the lower legs with the left leg more greatly infected than the right. The left radius showed active periostitis over the distal one quarter of the shaft, indicating active infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.



29

Figure 5-26 Cast metal plaque from Burial 29 (AAS 823846).

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended prone.

Hand Placement: Right arm extended with elbow flexed and hand on abdomen; left arm extended with hand on sacrum.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: Most of the cultural materials recovered from the burial were casket components. The casket handles recovered are like those from Burial 78. Cast white metal lid fasteners associated with the casket were also found (Figure 5-27). A two piece cast metal ornament was also collected which is doorknob shaped. Its use is unknown. Other materials include nails, tacks and fragments of sheet copper (Table AXIV). Fragments of wood found exhibited some red paint.

CULTURAL CHARACTERISTICS

Clothing Components: No artifacts were found besides one safety pin in the pelvic area which may not have been associated with clothing (Table AXV). The absence of buttons or other clothing materials may indicate that a burial shroud or gown without closures was employed.

PROPOSED BURIAL DATE

There were no diagnostic artifacts present that could be used to determine the date of burial. Although the coffin hardware was like or similar to that used for Burials 70 and 77, these handles and fasteners may have been stored for some years by the coffin builder and do not necessarily reflect the specific date of death and burial. The burials may therefore not be contemporaneous, although it is proposed that all of the burials in this area are approximately contemporaneous and probably postdate ca 1890 and pre-date 1927.

BURIAL 33

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 15 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poorly preserved with disturbance in the thorax region.

Inventory: The face and skull were fragmented as were the vertebrae, ribs, hands, and feet. All major bones of the post cranial skeleton were complete.

Paleopathology

Dental: All erupting and developing teeth were normal.

Infectious: None.

Developmental: The frontal bone was expanded and presents the possibility of craniotabes which in conjunction with cupping of the costochondral rib ends suggests rickets. Although these lesions do not present a classic picture of rickets (actually few cases do) they are suggestive.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NWS-ESE.

Body Placement: Extended supine.

Hand Placement: Arms extended along side of body.

Funerary Aspects

Casket Shape: Tapered toward feet.

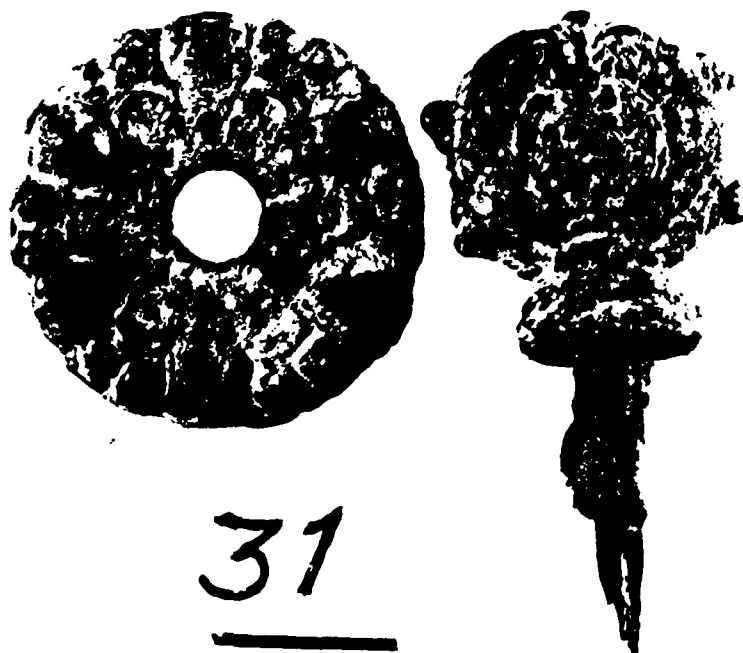


Figure 5-27 Lid fastener from Burial 31 (AAS 832152).

Casket Measurements: 83 cm long; 45 cm wide at top; 26 cm wide at foot.

Casket Hardware: The primary casket components consist of nails and screws (Table AXIV). A cast white metal plaque with the words "At Rest" was found in the thoracic area (Table AXIV). This is identical to the one found with Burial 70.

CULTURAL CHARACTERISTICS

Clothing Components: Two white porcelain buttons were found along the vertebral column. These have four holes through concave centers. Dating for such buttons is presented with Burial 17.

Grooming and Related Items: A black hard rubber comb was found on the north side of the casket (Figure 5-28). On one side words said, "Hercules Warranted Unbreakable," and on the other side "The Butler Hard Rubber Company." Hard rubber was first developed by Goodyear in the mid-nineteenth century, with the patenting of rubber buttons in 1851 (Crummett and Freeman 1969:71; Luscomb 1967:170). By 1900 molded vulcanized rubber was an important industry (Cook 1964:8). The hard rubber or vulcanite comb apparently was introduced ca 1860 (Noel Hume 1970:175). Hard rubber combs like the one with the burial are found in catalogs of the 1890s (Emmett 1969:105; Israel 1968:326), and do not appear to have changed significantly into the 1900s (Amory 1969:135; Sears, Roebuck and Company 1929:466). No information was found on the Butler Hard Rubber Company.

Nonpersonal and Related Goods: Two coins were found with the burial. The first one is a badly corroded 1889 Liberty nickle that was found within the left eye orbit. The other was a 1907 Barber dime (Figure 5-29). Coins were apparently used to keep the deceased individual's eyes from coming open (Puckett 1926:84). Parler (1962:2855) states that coins were also put into the ears in some instances to keep haunts and ghosts out. Although it is known that the burial postdates 1907, the specific date cannot be determined. Randolph (1951:313) observes that in the Ozarks some families keep corpse money. This money is set aside for several generations for the single purpose of keeping the deceased person's eyes closed. Aboriginal artifacts were also found with the burial, but their presence is undoubtedly fortuitous (Table AXVI).

PROPOSED BURIAL DATE

It is known that the burial was in or postdates 1907 and occurred previous to 1927. The early date was determined on the basis of the 1907 coin. Although the cast white metal plaque found is identical to the one with Burial 70, this does not indicate that the burials were necessarily contemporaneous. As noted earlier, casket hardware was probably often stored for years previous to use by the coffin builder.



33

Figure 5-28 Black rubber comb from Burial 33 (AAS 823754).



33

Figure 5-29 1907 Barber dime from Burial 33 (AAS 823753).

BURIAL 34

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 13 months \pm 4 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and complete disarticulation of the skeleton.

Inventory: The skull was entirely fragmented with only major bones preserved. The vertebrae and ribs were fragmented, while the hands were represented by only two phalanges. The postcranial skeleton was represented by only partial and fragmented long bones.

Paleopathology

Dental: The developing deciduous teeth were normal.

Infectious: The external surfaces of the basio-cranial elements showed active periostitis (Figure 5-30). The right tibia exhibited active periostitis on the medial surface of the shaft, while the left tibia exhibited only pitting. These lesions indicate an initial infection with localized foci.

Developmental: Both orbits exhibited initial cribra orbitalia (Figure 5-31), while the occipital and parietals were pitted. Again this would suggest iron deficiency anemia, sickle cell, or even rickets.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: WNW-ESE.

Body Placement: Extended supine.

Hand Placement: Upper arm extended with elbow flexed; hands crossed in thoracic region and pointed toward head.

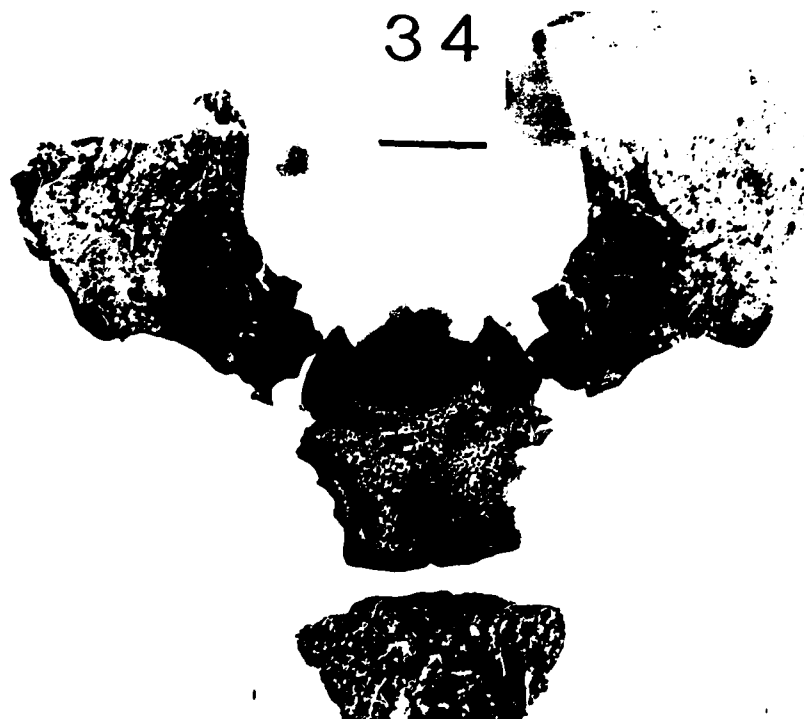


Figure 5-30 Basio-cranial elements from Burial 34 showing active periostitis (AAS 832165).



Figure 5-31 Orbits of Burial 34 showing cribra orbitalia (AAS 832163).

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 34 cm long; 16 cm wide.

Casket Hardware: The only casket components consist of nails and lining tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Eight shell buttons were recovered (Table AXV).

Five of the buttons exhibited four holes through a concave center, while the other buttons had two holes through concave centers.

Approximate dates for shell buttons are presented in Burial 10. Three brass safety pins were found scattered throughout the burial (Table AXV). Dating information is provided with Burial 17.

Nonpersonal and Related Goods: One prehistoric sherd and one flake were found in the grave fill above the head region (Table AXVI). These prehistoric artifacts (as well as those found with the other burials) are from the grave fill and were almost certainly introduced when the grave shaft was originally excavated through the underlying prehistoric site.

PROPOSED BURIAL DATE

As a result of the examination of artifacts with the burial, it appears that this one dates anytime ca 1890-1927. The primary diagnostic artifacts are shell buttons which were produced and used for a long period of time.

BURIAL 35

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 7 months \pm 2 months in utero, probably indicating a stillborn.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poorly preserved with the thorax disturbed.

Inventory: The skull was badly crushed and the postcranial skeleton, although badly fragmented, was complete.

Paleopathology

Dental: None.

Infectious: The ribs showed active periostitis indicating an active pulmonary infection. All long bones and the pelvis displayed extensive unremodeled periostitis indicating an active systemic infection.

Developmental: Unremodeled cribra orbitalia in both eye orbits suggesting anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms flexed at elbow with hands upon abdomen.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 46 cm long; 22 cm wide.

Casket Hardware: The only components consisted of nails (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One shell button with two holes through a concave center was found by the right collar area (Table AXV). Dating information is provided with Burial 10. The only other components were two brass safety pins. These were probably used to secure a diaper, while the button was used on a gown. Dating information for safety pins is presented with Burial 17.

PROPOSED BURIAL DATE

There are no diagnostic artifacts that provide specific information to determine the date of interment. It is proposed that the shell buttons are probably American made and date post-1890 and pre-1927.

BURIAL 36

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation, but almost complete disarticulation of the skeleton.

Inventory: Although the cranium was fragmented, the entire skeleton was recovered.

Paleopathology

Dental: Normal development of the deciduous dentition.

Infectious: Extensive unremodeled periostitis was observed on all cranial bones, ribs, clavicles, scapulae, pelvis, and all long bones (Figure 5-32). These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Trauma: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: WSW-ESE.

Body Placement: Extended supine.

Hand Placement: Probably the arms were extended along each side with elbows slightly flexed and hands along each side.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 46 cm long; 20 cm wide.



Figure 5-32 Skeleton of Burial 36 showing active periostitis of all bones (AAS 832170).

Casket Hardware: Only casket nails were recovered (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One white porcelain button with four holes through a concave center was collected (Table AVX). Dating information is presented with Burial 17. A brass straight pin was also found, but this may not have necessarily been associated with clothing. The button was probably used on a gown.

PROPOSED BURIAL DATE

The white porcelain button provides little insight on burial date. It is proposed that this burial was probably contemporaneous with others in this portion of the cemetery (i.e., ca 1890-1927).

BURIAL 37

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation and entire skeleton disarticulated.

Inventory: The skull was complete but fragmented as was the postcranial skeleton with only a few fragments of the hands and feet recovered.

Paleopathology

Dentition: Normal deciduous development.

Infectious: Almost all long bones displayed areas of active periostitis indicating systemic infection.

Developmental: Active cribra orbitalia indicating anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Probably arms extended along sides, slightly flexed at elbows, with hands along each side.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 60 cm long; 25 cm wide.

Casket Hardware: Only nails were observed (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two white porcelain buttons with four holes through the concave center were found (Table AXV). Dating information is provided with Burial 17. Pins include one straight pin and four brass safety pins. Three of the safety pins were found in the pelvic area, and were probably associated with a diaper. Another safety pin was found in the general fill. Information on dates of safety pins is provided with Burial 17 and similar information for straight pins is with Burial 25.

Nonpersonal and Related Goods: Three prehistoric pottery sherds were recovered from the grave fill and were probably introduced when the grave shaft intruded into the underlying prehistoric site (Table AXVI).

PROPOSED BURIAL DATE

No artifacts were recovered that were diagnostic enough to permit a specific determination of the date of interment. While it may be proposed that burial was conducted ca 1890-1927, this suggestion is based on dates of surrounding graves exhibiting similar artifact assemblages.

BURIAL 38

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with lower legs disturbed by backhoe.

Inventory: The skull was crushed but represented by the major elements. The vertebrae, ribs, hands, feet and long bones were all present but fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along sides, with elbows slightly flexed, and hands at the side.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: Unknown length; 27 cm wide.

Casket Hardware: Nails and lining tacks were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Only three safety pins were found (Table AXV). These were probably used to secure a diaper. Dating information is provided with Burial 17.

Nonpersonal and Related Goods: A prehistoric pottery sherd and chert flakes were found, but their presence is probably fortuitous (Table AXVI).

PROPOSED BURIAL DATE

It was not possible to determine the date of interment on the basis of the artifacts found. It is proposed that it probably dates ca 1890-1927 based on the similarity of the artifact assemblage to those found with surrounding burials.

BURIAL 39

BIOLOGICAL CHARACTERISTICS

Demographic

Age: 35-39 years.

Sex: Female.

Race: Cranial preservation was not sufficient for either morphological or metric evaluation of genetic affinity.

Preservation

Condition: Good preservation with normal articulation.

Inventory: The cranial and postcranial skeleton was complete, although the skull was fragmented.

Paleopathology

Dental: A total of six maxillary teeth were lost premortem, while one third molar was decayed down to the roots. A partial plate replaced two central incisors and the first molar (Figure 5-33). Considering the condition of the incisor alveolar bone and the trauma discussed below, it is possible that these teeth were lost as a result of trauma. One mandibular tooth was lost premortem and four caries were observed.

Infectious: Both right and left ribs 9 and 10 exhibited active periostitis suggesting pulmonary infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: Right ribs 9 and 10 exhibited callus formation from healed fractures. The left ulna and radius showed healed fractures of the distal epiphyses, which occurred during adulthood because bone growth was complete (Figure 5-34). The left humerus also showed a healed fracture of the superior one third of the shaft (Figure 5-35). These healed fractures could have been the result of interpersonal

violence, but the pattern is not typical (i.e., absence of parry fracture), but could have resulted from an automobile or machinery (farm equipment) accident.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with both hands resting across each other over the top of the left ilium.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 205 cm long; 67 cm wide.

Casket Hardware: Considerable materials were found (Table AVIV). Six cast white metal handles were found that were identical to those found with Burial 70. Two types of lid fasteners were found. One type appears to have been associated with the casket and is identical to fasteners found with Burial 70. The other type was identical to that found with Burial 67, which probably came from a casket receptacle box. A two piece cast ornament was also found that was similar to the one found with Burial 31.

One cast white metal plaque with the words "At Rest" was found which was identical to the one found with Burial 70. A final artifact associated with the casket was an oval glass that was placed over the cranial and thoracic area of the burial as a viewing window (Figure 5-36). As early as 1848 with the Fisk metallic coffin there was a plate of glass permitting the face to be visible (Habenstein and Lamers 1975:263). The use of the glass top was increasingly integrated with the design and concept of the container. Habenstein and Lamers (1975:272-273) state:

In presenting the new style of burial receptacle, the manufacturer's brochure of 1862 pointed out that it possessed such advantages as being simple, "chaste," i.e., pure and simple in design, not ornate and airtight Perhaps the most radical change in the construction of this casket, as over against the burial case, was in its top, which consisted of two large sections of plate glass, between which the name plate was located. Each of the glass sections had an ornamented cap which could be screwed on before or after the funeral ceremonies. Thus the encasing of the body, the primary idea expressed in earlier receptacles, is modified toward the presentation of the

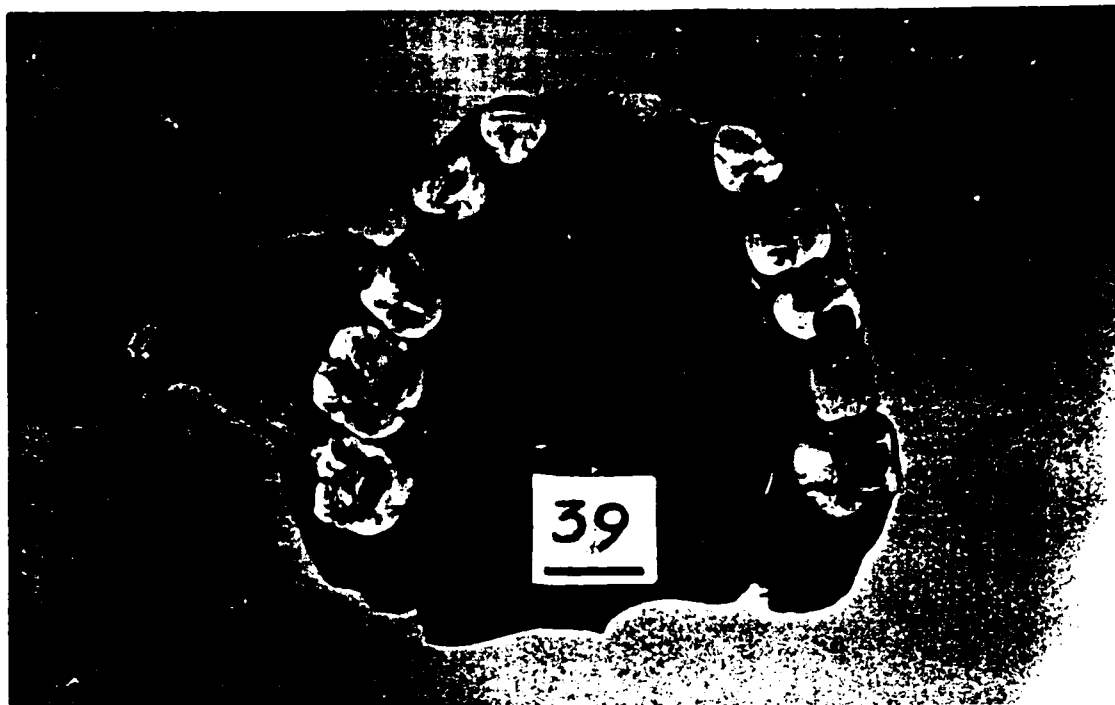


Figure 5-33 Partial maxillary plate in place from Burial 39 (AAS 823421).

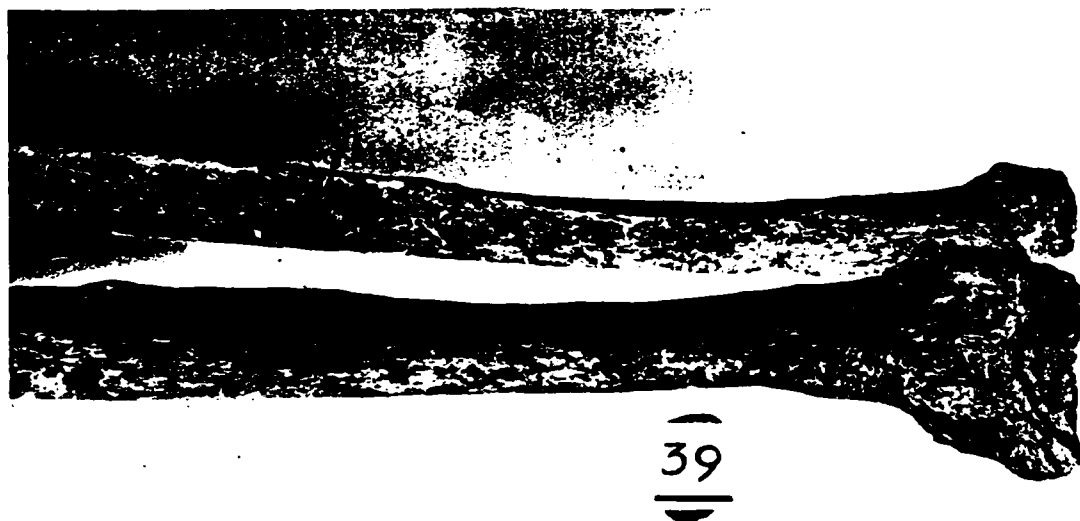


Figure 5-34 Healed fractures of the distal left radius and ulna of Burial 39 (AAS 823412).



39

Figure 5-35 Anterior view of the left humerus of Burial 39 showing healed fracture (AAS 832176).

dead in a receptacle designed to provide an aesthetically pleasing setting for its visual prominent and dramatically centered object of attention.

CULTURAL CHARACTERISTICS

Clothing Components: Buttons include shell and porcelain ones (Table AXV). One of the shell buttons had a brass star attached to one surface. The white porcelain buttons had four holes through concave centers. Dating information for shell buttons is presented with Burial 10; similar information for porcelain buttons is found with Burial 17.

Grooming and Related Goods: There were a number of pieces of jewelry with the burial. A silver ring with "100" stamped on the inside was found on the right hand. Two or three strands of glass beads were found around the neck (Figure 5-37). A strand of barrel-shaped beads exhibited the following colors: light blue, dark blue, and yellow. Another strand consisted of light blue and dark blue barrel-shaped beads; light blue blackberry shaped beads; drawn glass barrel-shaped beads; and small hexagonal black beads. Noel Hume (1969:54) observes that glass beads are generally hard to date, since the vast majority lack distinguishing features, being roughly globular with holes of varying sizes and a great diversity of color. A possible gold filled earring was found on the right side of the cranium.

A brown synthetic ornate haircomb was found in the cranial area (Figure 5-38). It was apparently made to resemble tortoise shell. Large hair ornaments of celluloid or other early plastics made to resemble tortoise shell are shown in catalogs of the 1890s (Emmet 1969:183). While such hair ornaments were made into the 1920s, they do not appear as large and elaborate (Amory 1969:935; Sears, Roebuck and Company 1929:86-87).

A partial dental plate was found on the right side of the skull and just above it. By the late 1860s and early 1870s, dentists were using celluloid for denture plates, replacing hard rubber then being used (Cherry 1967:18). The plate was formed to provide an artificial palate with artificial teeth replacing the two incisors and the first molar on the anatomical left. No date has been determined for this artifact.

PROPOSED BURIAL DATE

The artifacts providing the best interpretations of the date of interment are the buttons and comb. It is proposed that the burial dates ca 1890-1900. As noted, it appears that the nature of hair combs changed in the 1900s, although it is also possible that this style of comb remained popular in the area or among these peoples to a later period.



Figure 5-36 Glass window from Burial 39 (AAS 823642).

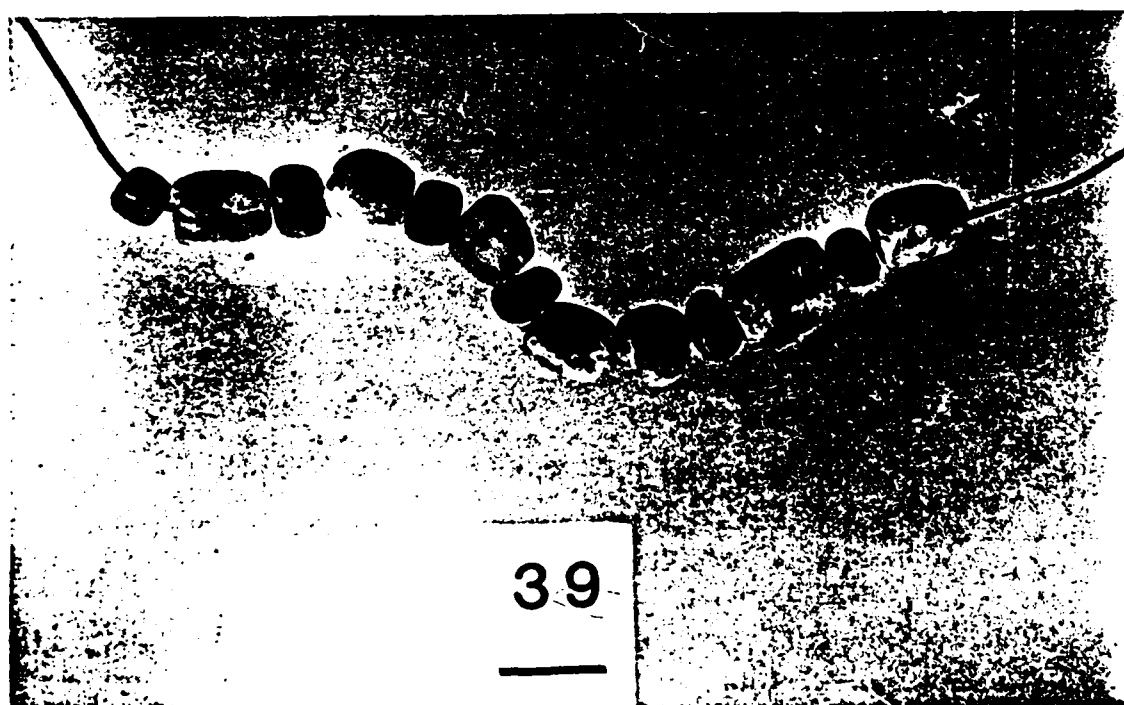
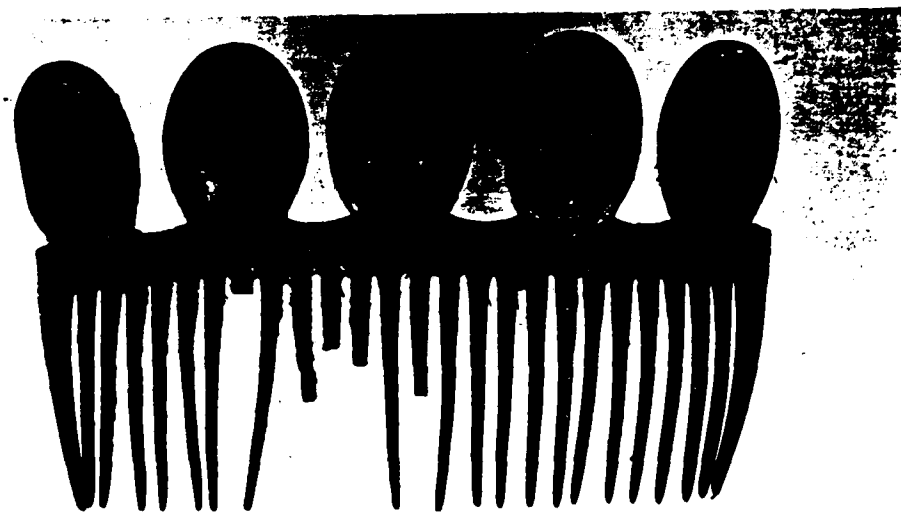


Figure 5-37 Glass beads from Burial 39 (AAS 823408).



39

Figure 5-38 Haircomb from Burial 39 (AAS 823415).

BURIAL 40

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 20 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation with good articulation except the feet which were disturbed by rodents.

Inventory: Skull was complete, but fragmented as were the ribs and vertebrae. The long bones were complete while the hands and feet were incomplete and fragmented.

Paleopathology

Dental: Deciduous teeth were normally developed.

Infectious: The sternal ends of ribs 7 through 10 showed unremodeled striations which suggest a possible pulmonary infection.

Developmental: Active cribra orbitalia and fine pitting on the parietals, frontal, and occipital. These lesions indicate active anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along side with elbows flexed and hands crossed on abdomen; left hand is atop the right one.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: Nails only were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Six white porcelain buttons with four holes through concave centers were found (Table AXV). These were along the vertebral column and extended down to the sacrum. One brass safety pin was also found between the ischia. This was probably associated with a diaper. Dating information for porcelain buttons and safety pins is presented with Burial 17.

Nonpersonal and Related Goods: Five prehistoric sherds were recovered from the grave fill and were introduced as the grave shaft was intruded into the underlying prehistoric site.

PROPOSED BURIAL DATE

The artifacts provide little chronological information and it is proposed that this burial is contemporaneous with the others in the area (i.e., ca 1890-1927)

BURIAL 41

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 40-49 years.

Sex: Female.

Race: Face not complete enough for either metric or morphological observations of ethnic affinity.

Preservation

Condition: Fair condition with perfect articulation.

Inventory: Skull, vertebrae, ribs, long bones, hands, and feet are all complete but fragmented.

Paleopathology

Dental: All but one incisor and canine have been lost premortem from the maxilla, while the mandible was completely edentulous.

Infectious: Both tibiae exhibited remodeled pitting and striations suggesting a previous lower leg infection.

Developmental: The entire cranial vault was covered with fine remodeled pitting which most likely was due to age, but could reflect a much earlier case of porotic hyperostosis.

Degenerative: All vertebrae exhibited moderate osteophytosis with the cervical and lumbar vertebrae more pronounced than the thoracic. The lumbar articular facets also exhibited osteoarthritic lipping. All major limb joints exhibited osteoarthritic lipping. These lesions are indicative of advanced age and a rigorous life style.

Neoplasm: A button osteoma (benign tumor) was found on the right parietal at the temporal line.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Upper arms extended with elbows flexed and hands on abdomen; hands folded over each other with left hand atop right one.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 224 cm long; 50 cm wide.

Casket Hardware: Components included cast white metal handles and lid fasteners. Casket handles are identical to those with Burial 70. Ornate lid fasteners were probably associated with the casket; they are identical to those found with Burial 70. Less ornate ones were probably used with an outside receptacle used to hold the casket. These are identical to ones found with Burial 67.

A cast white metal plaque with the words "At Rest" was found in the thoracic area (Figure 5-39). It was probably mounted outside the casket on the lid. Other materials included nails, a screw, and a lining tack (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two metal buttons covered with black fabric were found by each wrist (Table AXV). These were the only buttons found. Fabric covered buttons were used as early as the 1700s. By the early nineteenth century, machines were used to make such buttons and iron shells replaced wooden molds (Luscomb 1967:70). Machine covered fabric buttons are still produced today. Brass snaps were found in the thoracic area which may have been used as dress closures. Dating information is presented with Burial 14. One brass safety pin was also found in the thoracic area.

Grooming and Related Goods: A number of pieces of jewelry were found with this burial. A gold filled loop earring for pierced ears was

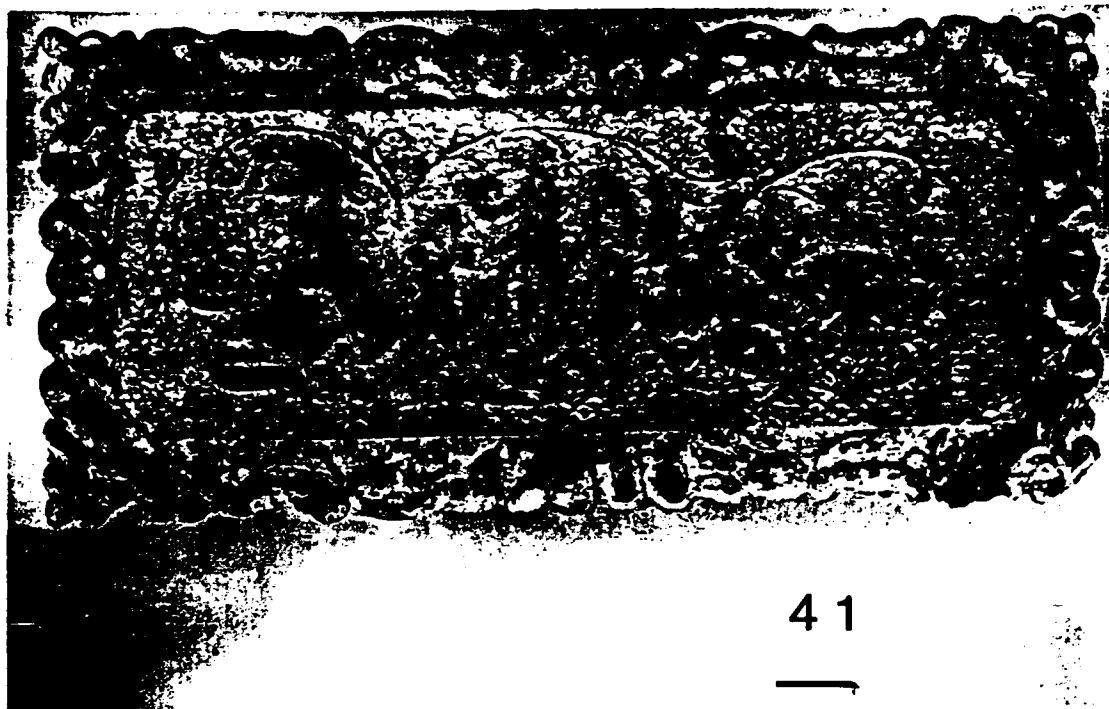


Figure 5-39 Cast metal plaque with Burial 41 (AAS 823705).



Figure 5-40 Gold filled earring with Burial 41 (AAS 823706).

found above the left humerus (Figure 5-40). Identical earrings are shown in catalogs of the 1890s (Emmet 1969:179; Israel 1968:431) as well as the late 1920s (Sears, Roebuck and Company 1929:519). It is unknown how long they predated and postdated this period. A silver ring was found on the left hand. There is a "100" stamped on the inside.

Two small collar pins or similar pieces of jewelry were found by the right and left collar areas. These square, gold plated ornaments exhibited floral patterns. They are similar to decorated cufflinks of the 1890-1920s.

Nonpersonal and Related Goods: Two prehistoric pottery fragments were also found in the gravefill. Their presence was not intentional (Table AXVI).

PROPOSED BURIAL DATE

Most of the artifacts found with the burial do not provide specific insights on the period of interment. The presence of snap fasteners would suggest a possible post-1900 burial, since they became popular after that time. It is therefore proposed that period of burial was ca 1900-1927.

BURIAL 42

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-39 years.

Sex: Female.

Race: Unknown, face fragmented.

Preservation

Condition: Excellent preservation with normal articulation.

Inventory: The entire cranial and postcranial skeleton was complete except the face which was crushed.

Paleopathology

Dental: The maxilla was edentulous, while the canines and incisors were missing premortem from the mandible. The mandibular molars had four caries.

Infectious: None.

Developmental: The left patella was deformed with a medial facet which was too narrow.

Degenerative: The lower lumbar vertebrae exhibited mild osteophytotic lipping.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along each side with hands along side the pelvis.

Funerary Aspects

Casket Shape: Tapers slightly toward bottom.

Casket Measurements: 218 cm long; 54 cm wide at top.

Casket Hardware: Cast white metal casket handles are identical to those from Burial 29. Additional handles were found that were apparently used on an outside box or vault. These were painted black. They are similar to handles from Burial 24. Two lid fasteners were found. The handle portion is identical to fasteners from Burial 15, but the base differs in ornamental pattern.

A cast white metal plaque was found with the words "At Rest". This plaque is identical to the one used with Burial 29. Other artifacts include nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: No buttons or snaps were found with this burial. Two brass safety pins were found that may have been used to close a gown or shroud. A piece of fabric was found below the cervical vertebrae.

Grooming and Related Goods: A silver ring was found on a finger of the right hand (Table AXV). This was a very narrow undecorated band.

Nonpersonal and Related Goods: Prehistoric pottery fragments and chert flake were found within the burial context, but their presence is probably accidental (Table AXVI).

PROPOSED BURIAL DATE

None of the artifacts present with the burial provide insights on the date of burial. Since casket hardware recovered with this burial is like that found with Burials 15, 24 and 29, it can be proposed that the burials were approximately contemporaneous and date ca 1890 or 1900-1927. Although it is unknown how long the casket builder maintained such supplies and used them, it would appear reasonable to assign this burial to that time period.

BURIAL 43

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 45-49 years.

Sex: Female.

Race: Skull fragmented, no observations.

Preservation

Condition: Poor condition, complete articulation.

Inventory: Skeleton was complete, but the skull, ribs, vertebrae, hands and feet were fragmented.

Paleopathology

Dental: The maxilla was edentulous and only a first premolar remained in the mandible.

Infectious: The endocranial surfaces of the frontal and parietals were covered by nodules of sclerotic bone (Figure 5-41). These lesions are most characteristic of sclerotic healing of an endocranial infection, which was quite common among the Cedar Grove subadults. Other diagnoses such as neoplasm are possible. Both tibiae and fibulae showed remarkable expansion of their shafts and healed periostitis. This indicates a healed lower limb infection.

Developmental: None.

Degenerative: The lower thoracic and lumbar vertebrae showed initial osteophytotic lipping, while thoracic vertebra 9 exhibited a Schmorl's node. The carpals of the hands and metatarsals of the feet exhibited osteoarthritic lipping. These lesions indicate a strenuous life style.

Neoplasm: None.

Traumatic: The right ulna exhibited a healed fracture of the shaft (Figure 5-42). Although not classic, this lesion is probably a parry fracture and suggests interpersonal violence.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Upper arms extended with elbows slightly flexed; hands crossed over abdomen with left hand further up lumbar vertebrae than right hand.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 212 cm long; 52 cm wide.

Casket Hardware: Cast white metal casket handles are like those found with Burial 70. Lid fasteners apparently associated with the casket are identical to those found with Burial 70. Relatively simple fasteners were also found and may have been used on an outside box or vault. Other components included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One shell and two white porcelain buttons were found (Table AXV). The shell button had two holes through the center, while the other buttons had four holes through concave centers. Dating information for shell buttons is presented with Burial 10, and that for porcelain buttons with Burial 17. Fragments of black fabric were also found with the burial.

Grooming and Related Items: Two gold earrings for pierced ears were found in the cranial area (Table AXV). These are identical to the earring found with Burial 41, and the dating information presented there also applies here. Barrel-shaped necklace beads of green and yellow glass were also found. These beads appear identical or similar to ones found with Burial 39. A black haircomb of hard rubber, celluloid, or some other early plastic, was recovered from behind the skull (Figure 5-43). Information on haircombs is presented with Burial 39.

Nonpersonal and Related Goods: One 1854 seated liberty half dollar was found on the upper anatomical right vertebrae area (Figure 5-44). It exhibits the New Orleans mint mark and was perforated, as if to be worn. It may have been sewn to the clothes like the coin with Burial 95. Some uses of coins are discussed for Burial 33. It was also

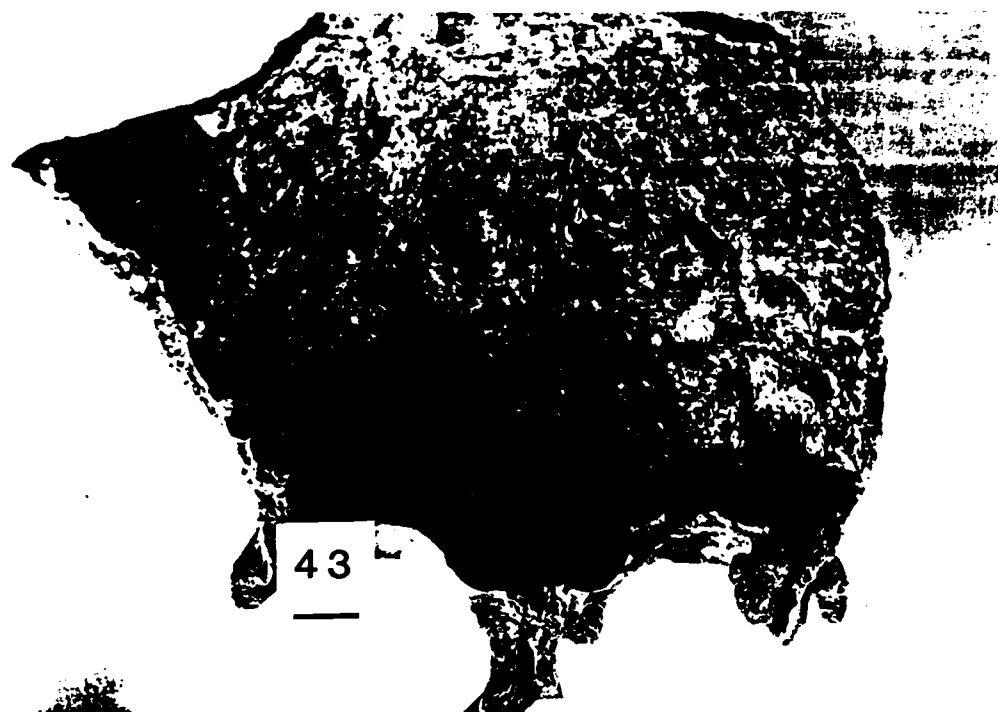


Figure 5-41 Endocranial surface of frontal from Burial 43 showing sclerotic nodules (AAS 823712).



Figure 5-42 Lateral view of right ulna showing healed fracture (AAS 823713).

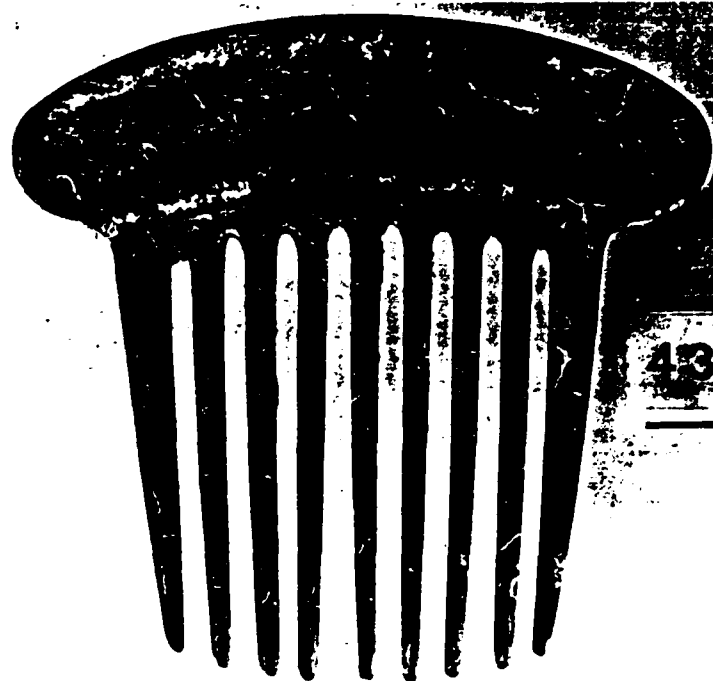
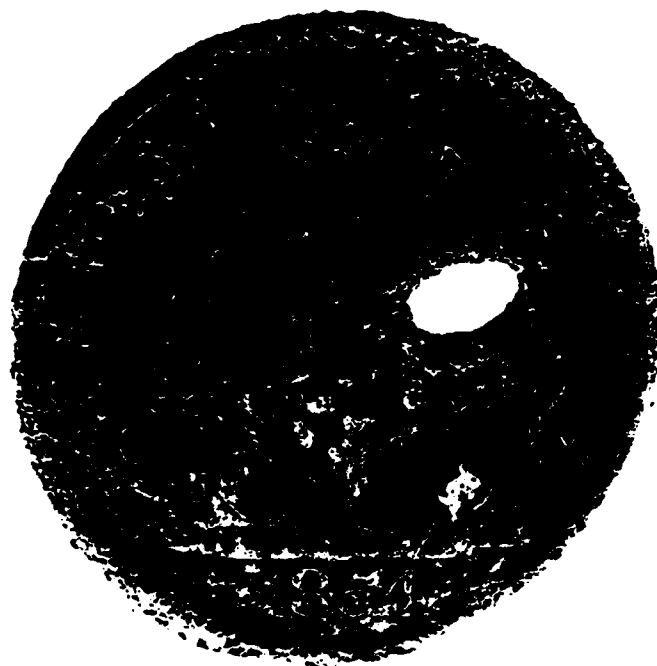


Figure 5-43 Haircomb from Burial 43 (AAS 823723).



43

Figure 5-44 Half dollar from 1854 with Burial 43 (AAS 823725).

believed that by wearing a penny around the neck, one could cure indigestion (Puckett 1926:388). Puckett (1926:314) also states, "The silver coin, so effective in warding off conjuration, is equally effective in bringing good luck when tied around the leg or worn in a necklace about the neck." He adds that a silver ring is also efficient. This coin may therefore relate to some folk tradition.

Prehistoric pottery fragments were also found in the grave fill, but their presence is assumed to be accidental (Table AXVI).

PROPOSED BURIAL DATE

Most of the artifacts recovered with this burial provide no insights on the specific date of interment. As noted earlier, such things as porcelain buttons, haircombs, and gold earrings were made in the 1890-1920s, and probably much earlier and later. The coin merely indicates that the burial postdates 1854. If this female was 46-50 years old, and she was buried in the early 1900s, she could have been born in 1854 and this could be a birth coin. Shell buttons were first produced in America in the late 1880s-1890s and were popular into the 1950s. It is proposed that this burial dates ca 1900-1927.

BURIAL 44

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 50+ years.

Sex: Male.

Face: Face fragmented, no observations.

Preservation

Condition: Poor preservation and normal articulation.

Inventory: Skeleton complete but all components except the long bones were fragmented.

Paleopathology

Dental: One maxillary tooth was lost premortem and four caries plus two abscesses were observed. The mandibular dentition was complete and no caries were observed.

Infectious: Both clavicles have expanded shafts and displayed healed periostitis. The femoral shafts were expanded and roughened, while both tibiae and fibulae showed extensive periostitis which was mostly remodeled. These lesions indicate a systemic infection in the process of healing.

Developmental: The right articular facets of the axis and third cervical vertebrae were fused. The right tibia exhibited an osseous excrescence on the distal lateral aspect just superior to the fibular articular facet. The fibula showed a corresponding growth.

Degenerative: Both right and left tali, calcanea, and cuboids showed marked osteoarthritic lipping.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along sides with hands folded over the respective femora.

Funerary Aspects

Casket Shape: Tapers toward the feet.

Casket Measurements: 209 cm long; 50 cm wide at top; 30 cm wide at feet.

Casket Hardware: Casket handles are identical to those found with Burial 70. Cast white metal lid fasteners were also found like those with Burial 70. Other casket components include nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One bone button with four holes through a concave center was found by the right sciatic notch. This may have been associated with trousers or underwear. Shell buttons with four holes through concave centers were found in the upper thoracic region. These may have been used on a shirt. Dating information for bone and shell buttons is presented with Burial 10. Metal buttons were found in the pelvic area (Table AXV). These were painted black and exhibited stamped cross-hatched patterns (Figure 5-43). Their positions would suggest association with trousers. These may be buttons used to attach suspenders. A buckle, also painted black, was found in the thoracic area (Figure 5-46). An identical buckle was found with Burial 101, a youth 10 years old. This was probably also a male. Metal buttons with cross-hatching and black paint were also found with that burial. Black metal buttons with cross-hatching are shown in the 1897 Sears, Roebuck



44



Figure 5-45 Metal button with Burial 44 (AAS 832734).



44



Figure 5-46 Black metal buckle with Burial 44 (AAS 823733).

and Company catalog (Israel 1968:320) as fly and suspender pant buttons. It is proposed that the black buckles were also associated with suspenders. According to the field notes, several metal snaps were found with the burial (Table AXV). Most of these were in the pelvic area. While snap fasteners appear to be most consistently associated with female burials, it is proposed that the snaps with this burial may actually be rivets or snaps used with suspenders. Such fasteners are often used to hold leather parts to buckles and fabric portions of the straps.

Several straight pins were found. Their use is indeterminate, but they may have been used for placement of clothing or casket lining.

PROPOSED BURIAL DATE

Although none of the artifacts are diagnostic enough to permit determination of a specific interment date, it is proposed that burial occurred ca 1890-1927. Shell buttons came into use with the late 1880s to early 1890s, and pant buttons are like those in catalogs of the 1890s. It would therefore appear that burial is contemporaneous with other ones in this cemetery.

BURIAL 45

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation with complete articulation.

Inventory: Skeleton complete except fragmentation of the hands and feet.

Paleopathology

Dental: Normal dental development.

Infectious: Extensive active periostitis on cranium, face, mandible, ribs, scapulae, pelvis, and all long bones. This indicates severe systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: WNW-ESE.

Body Placement: Extended supine.

Hand Placement: Arms extended with elbows slightly bent; left hand on lower rib cage and right hand on right ilium.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 47 cm long; 17 cm wide.

Casket Hardware: Nails and lining tacks were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three white porcelain buttons with four holes through concave centers were found on the midthoracic and lower lumbar areas (Table AXV). Six brass safety pins were also found. These were on the lower lumbar region, lower left rib cage, and between the femura with a fragment of fabric. These were probably associated with a diaper, although the quantity of pins cannot be explained. Dating information for the buttons and pins is presented with Burial 17.

PROPOSED BURIAL DATE

None of the artifacts are diagnostic and provide insights on the date of interment. It is proposed that the burial is probably contemporaneous with others in the area (i.e., ca 1890-1927).

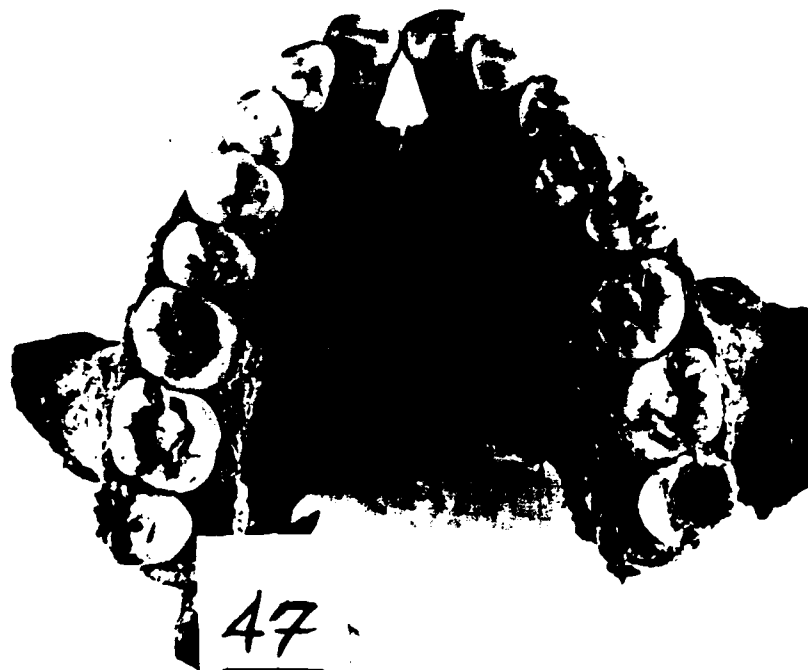


Figure 5-47 Occlusal view of maxillary dentition from Burial 47 showing shovel shaped incisors (AAS 832203).

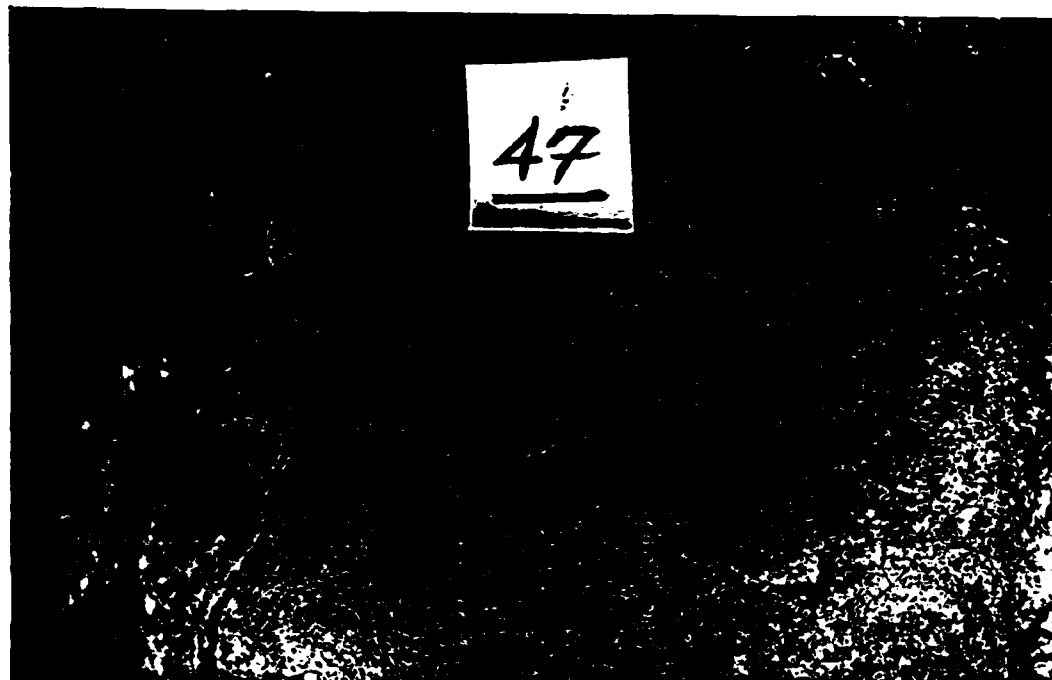


Figure 5-48 Superior view of left parietal showing lesions indicating porotic hyperostosis in Burial 47 (AAS 823505).

BURIAL 47

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-39 years.

Sex: Female.

Race: Presence of nasal gutter suggests an African ancestry, while extreme shoveling of the incisors might argue for American Indian admixture (Figure 5-47).

Preservation

Condition: Good preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton, but fragmented face.

Paleopathology

Dental: All maxillary teeth present with two occlusal caries. The complete mandibular dentition showed one carie.

Infectious: Both right and left distal ulnae and radii showed localized healed periostitis and expanded shafts. Both right and left tibiae and fibulae showed pitted and striated cortex. These lesions suggest localized healed infections. A small smooth walled lytic lesion was found just anterior to and superior of the right mastoid.

Developmental: The entire cranial surface was pitted while portions displayed a fine lattice structure (Figure 5-48). These lesions in conjunction with diploic expansion indicate healing poritic hyperostosis resulting from a recent episode of anemia. The sex and age of this individual suggests that the anemia was due to iron deficiency resulting from an iron poor diet and repeated pregnancies.

Degenerative: None.

Neoplasia: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms flexed at elbows about 90-100 degrees with hands resting on the lower thoracic region.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 200 cm long; 74 cm wide.

Casket Hardware: Handles were of the swing bail type (Figure 49-1). These do not appear to be as ornate as other handles. They are identical to ones from Burial 48. Lid fasteners are like those found with Burial 70. Other materials included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Interesting artifacts definitely associated with the burial were two shoe heels made of multiple layers of leather and metal and probable shoe eyelets (Table AXV). Dating information for shoes is presented with Burial 17. Other materials included fragments of black and brown fabric at the foot end of the casket.

PROPOSED BURIAL DATE

Because of the sparsity of cultural materials, it is difficult to determine the date of interment. Examination of the shoe parts suggests a possible 1890s-1900s burial, but this is not definite. The absence of cultural materials associated with clothing appears unique and suggests use of a shroud or gown without buttons or other types of closures.

BURIAL 48

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 14 ± 3 years.

Sex: Skeletal unknown, but the presence of snap fasteners suggests a female designation as these items were consistently found with females.

Race: Unknown.

Preservation

Condition: Excellent preservation, but greatly disturbed thorax articulation.



47

Figure 5-49 Swing bale handle with Burial 47 (AAS 832204).

Inventory: Complete cranial and postcranial skeleton except fragmentation of the face and skull.

Paleopathology

Dental: The maxillary and mandibular dentition was complete and there were four caries on the mandibular molars.

Infectious: None.

Developmental: Healed cribra orbitalia. Pitting and slight parietal expansion indicates healed porotic hyperostosis. These lesions suggest a previous case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Right arm at side with hand on right ilium; left arm folded on thoracic area with hand on left sacrum and pubic area.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 204 cm long; 58 cm wide.

Casket Hardware: Casket hardware are identical to those found with Burial 47 (Table AXIV). Lid fasteners of cast white metal are like those with 70 and 31. A less ornate fastener is like that from Burial 67 and may have been used on an outside box or vault. A two piece ornament is identical to that found with Burial 67. Other materials are listed in Table AXIV.

CULTURAL CHARACTERISTICS

Clothing Components: Buttons include two white porcelain ones, one with four holes and the other with two holes. These were found in the upper thoracic area. Two metal buttons were found, one of these by the right wrist. Dating information for porcelain buttons is presented with Burial 17. Metal buttons were made as early as the 1600s (Crummett and Freeman 1969:53) and continue to be manufactured.

A number of snap fasteners were found in the pubic and upper lumbar region. These were probably used as dress or gown closures (Table AXV). At least one of these was brass.

PROPOSED BURIAL DATE

The cultural materials recovered provide little information on the date of interment. The presence of a quantity of snap fasteners would suggest a post-1900 burial. None of the other artifacts would contradict such an interpretation.

BURIAL 49

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 8 months \pm 2 months in utero.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Skull fragmented, postcranial skeleton complete except hands and feet which were represented by only two phalanges.

Paleopathology

Dental: Normal development.

Infectious: Extensive periostitis with some remodeling on the endocranial surface of the frontals (Figure 5-50). Active periostitis was observed on the basio-cranium, mandible, temporals, and ribs.

Patches of active periostitis was found on all long bones, scapulae, and pelvis. These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.



Figure 5-50 Endocranial surface of frontal from Burial 29 showing active periostitis (AAS 823504).

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 63 cm long; 23 cm wide at top; 28 cm wide at foot.

Casket Hardware: Nails only were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three white porcelain buttons with four holes through concave centers were found (Table AXV). These were in the thoracic region. Two brass safety pins were also found. One of these was associated with white fabric, and was probably used to secure a diaper.

One eyelet was found, but there was no additional evidence to suggest that shoes were present in the burial.

PROPOSED BURIAL DATE

The artifacts present provide no specific insights on the date of interment. The burial is probably contemporaneous with others in this area, (i.e., ca 1890-1927), but this cannot be supported by the assemblage.

BURIAL 50

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 9 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and complete disarticulation of the arms and thorax.

Inventory: Skull, ribs, and vertebrae all fragmentary, while the hands and feet were represented by only a few fragments. All long bones were complete although several were fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis of the basio-cranium indicating a localized infection or the beginning of a systemic infection.

Developmental: Unremodeled cribra orbitalia indicating active anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Disarticulated; arms probably extended with hands resting along each side of the pelvic region.

Funerary Aspects

Casket Shape: Roughly rectangular.

Casket Measurements: 104 cm long; 24 cm wide at top; 22 cm wide at foot.

Casket Hardware: Nails only were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four white porcelain buttons with four holes through concave centers were found. These were probably associated with a gown. One safety pin was also collected by the femur. Dating information for these cultural materials is presented with Burial 17.

Fragments of shoe leather with five eyelets were also collected by the left foot. Shoes with eyelets and laces were produced from the 1890s, or earlier, into the 1920s, and are still available. Therefore no attempt has been made to date the fragments. As noted with Burial 17, folk tradition indicated that one should not be buried with shoes left on the feet.

PROPOSED BURIAL DATE

Specific date of burial cannot be determined because of the sparsity and nondiagnostic nature of the artifacts recovered. It is proposed that the burial was probably contemporaneous with others in this area (i.e., ca 1890-1927).

BURIAL 52

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Skull was crushed and fragmentary, while the hands and feet were highly fragmented. The postcranial skeleton was complete.

Paleopathology

Dental: Normal dental development.

Infectious: Possible patches of healed periostitis on the endocranial surfaces of the parietals. These lesions indicate a localized healed prenatal infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with hands resting on each of the ilia.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: Only nails and lining tacks were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One shell button with two holes through a concave center was found in the thoracic region. Others were white porcelain buttons with four holes through a concave center. These were primarily in the thoracic region. All buttons were probably used on a long gown. Dating information for shell buttons is given with Burial 10; similar information for porcelain buttons is presented with Burial 17. A number of brass safety pins with silver or nickel plating were found. These were below the right rib cage, right of the lumbar vertebrae, and below the ischium. They were probably associated with a diaper. Dating information is presented with Burial 17.

PROPOSED BURIAL DATE

The only cultural material providing some insight on date of burial is the shell button, which merely suggests a probable post-1890 date. It would appear that this burial was contemporaneous with others in this area.

BURIAL 54

BIOLOGICAL CHARACTERISTICS

Demographics

Age: The dental development indicates an age of 18 months ± 6 months, while femoral diaphyseal length suggests an age of 3 years (Ubelaker 1978). This disparity indicates a developmental (hormonal) disturbance.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation with normal articulation.

Inventory: Skull was fragmented, while the postcranial skeleton was complete with some fragmentation of small bones such as the ribs.

Paleopathology

Dental: Severe prenatal hypoplasia.

Infectious: Active cribra orbitalia and healed periostitis on the tibiae. These lesions suggest active anemia and healed localized infection of the lower legs.

Developmental: The greater than one year discrepancy between dental age and long bone growth suggests hormonal disfunction most likely somatotrophic.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with slight flexing at elbows; hands extended straight along each side of the body at pelvis.

Funerary Aspects

Casket Shape: Possibly tapers toward feet.

Casket Measurements: 112 cm long; 22 cm wide at top; 20 cm wide at feet.

Casket Hardware: Nails and one cast white metal coffin screw were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two brass safety pins were found in the pelvic region. These were probably associated with a diaper. Leather

fragments of soles and heels from two shoes were found with the feet. It appears that the shoes were on the individual. Dating information on shoes is presented with Burial 17.

PROPOSED BURIAL DATE

The artifacts present provide little insight on burial date. It is proposed that burial was ca 1890-1927, or contemporaneous with others in this area. None of the artifacts present contradict this interpretation.

BURIAL 55

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 17 ± 2 years.

Sex: Probable male.

Race: Unknown.

Preservation

Condition: Excellent preservation and normal articulation except the small bones of the hands and feet.

Inventory: The face was fragmented, but all other portions of the skeleton were complete.

Paleopathology

Dental: The complete maxillary dentition exhibited six caries while the mandibular dentition exhibited none. An unerupted tooth which looked like a mandibular canine (which was missing) was found embedded within the cancellous bone of the symphysis.

Infectious: The left femoral shaft exhibited unremodeled periostitis, which indicates an active localized infection.

Developmental: The calvarium displays extensive pitting with some remodeling which suggests a healing case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: A small circular expanded area of cortex was located in the center of the frontal which resembles a healed traumatic lesion. A deformed .38 calibre lead bullet was found in the dirt from the left thorax and was probably the cause of death.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Right humerus extended with elbow flexed and hand just lateral to left ilium; left humerus extended with elbow flexed and hand on lower thoracic region.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 206 cm long; 66 cm wide.

Casket Hardware: Cast white metal casket handles are like those from Burial 104. Lid fasteners were also found which were like those from Burial 70 (Table AXIV). Other materials include nails and tacks.

CULTURAL CHARACTERISTICS

Clothing Components: One nondiagnostic metal button was found in the thoracic region. A safety pin was also found in that general region. The sparsity of closures suggests that buttons were missing or a gown was used on the individual. Several eyelets were found in general fill, but their use has not been determined.

Nonpersonal and Related Goods: A bullet slug was found in the thoracic region. It is 19 mm long and 9.3 mm diameter, and may have come from a .38 calibre pistol. The distal end is slightly deformed.

PROPOSED BURIAL DATE

Artifacts present with the burial provide no insights on date of interment. It is proposed that it was ca 1890-1927, based on other burials in this area.

BURIAL 56

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and disturbed thorax articulation.

Inventory: The face, cranium, vertebrae, hands and feet were fragmented, while the major bones of the postcranial skeleton were complete.

Paleopathology

Dental: Normal dental development.

Infectious: Fine grained unremodeled periostitis on the endocranial surfaces of the occipital, frontal, and parietals, indicating active endocranial infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Probably the arms were extended along sides with hands resting along ilia.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 100 cm long; 15 cm wide at head; 27 cm wide at shoulder; 14 cm wide at foot.

Casket Hardware: The only components found were nails and decorative cast white metal tacks like those with Burial 85 (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four white porcelain buttons with four holes through concave centers were found (Table AXV). These were found along the right upper vertebral column, right lumbar region, and under the

left scapula. One brass safety pin was also found between the left femur and right tibia and fibula. Dating information for these artifacts is presented with Burial 17.

PROPOSED BURIAL DATE

The artifacts present provide few insights on determining the date of burial. It is proposed that burial was ca 1890-1927, as were other ones in this area.

BURIAL 57

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 7 \pm 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation with disarticulation of the thorax and left arm.

Inventory: Skull, some vertebrae and ribs, left scapula, and left fibula fragmented, while the remainder of the skeleton was complete.

Paleopathology

Dental: Normal dental development and one carie on the mandibular right second deciduous molar.

Infectious: Both ulnae and tibiae displayed active periostitis indicating infections confined to the lower arm and leg bones.

Developmental: None.

Degenerative: None.

Necroplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Left arm disturbed; right upper arm extended with elbow flexed and hand resting on left side of lower thoracic region.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 159 cm long; 36 cm wide.

Casket Hardware: Nails and tacks were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three shell buttons with two holes through concave centers were found along the vertebral column. Three white porcelain buttons with four holes through concave centers were found in the same region. These were probably associated with a blouse or shirt. Dating information for shell buttons is given with Burial 10; that for porcelain buttons is with Burial 17.

PROPOSED BURIAL DATE

The artifacts present do not permit determination of a specific burial date. Although porcelain buttons were made for a long period, American made shell buttons date post-1890s. It is therefore proposed that this burial dates ca 1890-1927.

BURIAL 58

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with almost complete disarticulation of the entire skeleton.

Inventory: The skull, vertebrae, ribs, hand, and feet were all badly fragmented. The postcranial skeleton, though complete, was all fragmented.

Paleopathology

Dental: Normal development.

Infectious: Active periostitis was observed on the right radius, pelvis, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Indeterminate; disturbed burial.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 83 cm long; 37 cm wide at head; 36 cm wide at the shoulder; 23 cm wide at foot.

Casket Hardware: The only materials found were nails and cast white metal decorative tacks like those with Burial 85.

CULTURAL CHARACTERISTICS

Clothing Components: Eight white porcelain buttons with four holes through concave centers were found in the upper thoracic region (Table AXV). Two safety pins were also found. One of these was in general fill, and the other over the left innominate with a piece of fabric. Dating information is presented with Burial 17. Other pieces of fabric were also found on the vertebral column. One piece of fabric was black.

PROPOSED BURIAL DATE

The artifacts present provide little information to facilitate specific dating of the burial. It is proposed that this burial is contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 59

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and badly disturbed, especially the thorax.

Inventory: The vertebrae and ribs were fragmented, while the skull was complete but crushed. The postcranial skeleton was complete with some minor breakage.

Paleopathology

Dental: Normal development.

Infectious: Active periostitis was observed on the basio-cranium, and the endocranial surfaces of the frontal, parietals, and occipital. Ribs 6 and 7 exhibited small patches of active periostitis on the pleural surfaces suggesting pulmonary infection which might include tuberculosis. The radii, ulnae, tibia, and fibulae all displayed patches of active periostitis. These lesions suggest active systemic infection.

Developmental: Active cribra orbitalia indicating anemia, while bowed tibia shafts suggest rickets.

Degeneration: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Disturbed; probable that arms were extended along sides with hands resting along ilia.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 100 cm long; 49 cm wide at the shoulder; 23 cm wide at the foot.

Casket Hardware: Nails and lining tacks were recovered (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: White porcelain buttons with four holes through concave centers were found in the mid-thoracic and lumbar regions (Table AXV). Dating information is presented with Burial 17. One brass straight pin with a piece of black fabric was also found in the lower rib and pelvic region (Table AXV). This may have been associated with a casket lining. Dating information for pins is given with Burial 25.

PROPOSED BURIAL DATE

The artifacts do not provide specific insights on dating, but it is proposed that this burial was contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 60

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 6 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation and disarticulation of the thorax and shoulder areas.

Inventory: The skull, vertebrae, and ribs were badly fragmented, while the hands and feet were represented by only three phalanges. Almost all long bones, especially those from the left side, were fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: The right humerus, radius, ulna, femur, fibula and pelvis all showed active widespread periostitis, indicating systemic infection.

Developmental: Extensive cribra orbitalia and porotic hyperostosis indicates severe anemia which in conjunction with the above described periostitis suggests sickle cell disease.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended along the sides with hands along ilia.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 67 cm long; 12 cm wide at head; 20 cm wide at shoulder; 12 cm wide at foot.

Casket Hardware: Nails and a fragment of a 2.54 cm wide iron band were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Thirteen white porcelain buttons with four holes through concave centers were found down the center of the skeletal remains. These were probably associated with a long gown that buttoned down the front. Brass safety pins were also found over the right and left innominates and upper lumbar region. These were probably associated with a diaper. Dating information for these cultural materials is presented with Burial 17.

PROPOSED BURIAL DATE

As in other instances with infant burials, the artifacts present provide little information to determine burial date. It is proposed that this burial was contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 61

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 40-49 years.

Sex: Male.

Race: Fragmentation of the face prevented the recording of morphology or metrics for the determination of genetic affiliation.

Preservation

Condition: Good preservation with disarticulation of the thorax.

Inventory: Except for the face which was fragmented, the skeleton was complete.

Paleopathology

Dental: Four maxillary teeth were lost premortem and six caries were observed.

Infectious: Both tibiae and fibulae exhibited evidence of remodeled periostitis indicating a healed infection of the lower limbs. The clavicular notches of the sternum exhibited active erosive lesions attributed to a focal infection.

Developmental: A developmental anomaly of the fifth lumbar and first sacral vertebrae resulted in scoliosis of the spine.

Degenerative: The thoracic vertebrae 4 through 9 showed wedging which resulted in kyphosis of the spine. The lumbar vertebrae exhibited osteophytosis which in conjunction with the above lesion indicates severe back stress. The first metatarsal and associated phalange showed extensive osteoarthritic proliferation indicating extensive damage to the left foot. All major joints of the limbs showed extensive osteoarthritis indicating a demanding life style.

Neoplasm: A small button osteoma was located in the central portion of the frontal.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with hands along ilia.

Funerary Aspects

Casket Shape: Tapers slightly toward feet.

Casket Measurements: 188 cm long; 44 cm wide at head; 40 cm wide at foot.

Casket Hardware: Cast white metal casket handles and lid fasteners are like those with Burial 70 (Table AXIV). Other materials include nails, tacks, and a screw.

CULTURAL CHARACTERISTICS

Clothing Components: One shell button with four holes was found in the thoracic region. Other buttons appear to have been metal, perhaps brass, with black fabric covering. One was found in the upper rib cage, one in the left thoracic region, and the other on the lower left ilium and distal end of the left radius. Dating information for shell buttons is presented with Burial 10. Information on covered buttons is given with Burial 41.

PROPOSED BURIAL DATE

The assumption is made that the shell button is American-made, which means that manufacture was post-1890. None of the other artifacts provide additional insights on dating. It is proposed that burial was ca 1890-1927.

BURIAL 65

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 25-29 years.

Sex: Female.

Race: There were no diagnostic morphological features of the face and cranium which would indicate any single genetic affiliation. Broken zygomatics prevented the use of metric determination of genetic affiliation.

Preservation

Condition: Excellent preservation with disarticulation of the thorax.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: A complete maxillary dentition exhibited two caries, while the mandibular exhibited six caries.

Infectious: The proximal one-half of the left tibia and fibula exhibited healed periostitis indicating a healed localized infection of the left lower leg.

Developmental: Remodeled cranial pitting indicates a healed case of porotic hyperostosis and thus an earlier case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation. NW-SE.

Body Placement: Extended supine.

Hand Placement: Left arm placed over abdomen with hand on right side of lumbar region; right arm extended at side with hand folded back up over right ilium and right half of sacrum.

Funerary Aspects

Casket Shape: Tapers toward foot.

Casket Measurements: 205 cm long; 41 cm wide at top; 21 cm wide at foot.

Casket Hardware: Casket handles and lid fastener are like those with Burial 70 (Table AXIV). Other materials include nails, tacks, and screws.

CULTURAL CHARACTERISTICS

Clothing Components: Five white porcelain buttons with four holes through the concave centers were found in mid-thoracic and cervical vertebrae region (Table AXV). These were probably associated with a blouse, or button top of a one piece dress. Dating information is given with Burial 17. A fragment of light brown fabric was also found in this region.

Grooming and Related Items: A silver ring about 3 mm wide with the word "Coin" stamped on the inside was found on the left hand. The only

other artifact was a red comb behind the head. This appeared to be made of a synthetic material, probably celluloid or some other early plastic. Information on such combs and materials is presented with Burial 39. This is probably a decorative haircomb.

PROPOSED BURIAL DATE

The artifact assemblage is similar to that found with the other burials in this area. It is probable that the burial dates to the ca 1890-1927 period.

BURIAL 66

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Female.

Race: Skull fragmentation prevented any observation of genetic affiliation.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Except for a complete, but fragmented skull, this skeleton was complete.

Paleopathology

Dental: One maxillary incisor and one molar, both with extensive caries remained, all others were lost premortem. Only one left canine with a cervical caries remained in the mandible, all others were lost premortem.

Infectious: None.

Developmental: All cranial bones were abnormally thickened indicating a metabolic disturbance of no obvious etiology.

Degenerative: The thoracic 12 vertebra exhibited a Schmorl's node indicating back stress. The phalanges of both hands and feet exhibited extensive osteoarthritic lipping, while all major limb joints displayed minor osteoarthritic lipping. These lesions indicate a stressful life style.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Left arm crossed over thoracic region with left hand on center of chest; right arm folded over with right hand over right ribs.

Funerary Aspects

Casket Shape: Tapers toward the feet.

Casket Measurements: 208 cm long; 57 cm wide at head; 21 cm wide at foot.

Casket Hardware: Casket handles and lid fasteners are identical to those with Burial 70. These appear to be associated with the casket. Another cast lid fastener, like those from Burial 67, was also found. This may have been used on an outside box or vault. A cast white metal plaque with the words "At Rest" was found in the thoracic region. This is identical to the one recovered from Burial 70. Other components include nails and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: A variety of buttons was found. One shell button with four holes through the center was found in the thoracic area. A white porcelain button with four holes through a concave center was found in the cranial-shoulder area. Brass buttons covered with fabric were found down the vertebral column. These were associated with black fabric, probably part of a dress. One white button with four holes appears to have been manufactured with a synthetic material. This was found just above the left ilium. Dating information is presented with Burial 10 for shell buttons, Burial 17 for porcelain buttons, and Burial 41 for covered metal buttons.

Nonpersonal and Related Items: Two prehistoric pottery fragments were found in the grave fill.

PROPOSED BURIAL DATE

Information on the artifacts present suggest that many of them were produced in the earlier to mid-nineteenth century. American-made shell buttons were not produced until ca post-1890. It is proposed that this

burial dates ca 1890-1927, and is contemporaneous with others in the area.

BURIAL 67

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 40-44 years.

Sex: Female.

Race: Unknown due to fragmentation of the skull.

Preservation

Condition: Good preservation with normal articulation.

Inventory: Except for a fragmented face and cranium, the skeleton was complete.

Paleopathology

Dental: Two maxillary molars were lost premortem and one carie was observed. Seven mandibular teeth were lost premortem and no caries were observed.

Infectious: The left tibia and fibula were striated and pitted indicating a healed localized infection of the lower left leg.

Developmental: The calvarium was pitted and striated indicating healed porotic hyperostosis and a previous anemia.

Degenerative: The cervical vertebrae exhibited initial osteophytosis. Both patellae exhibited osteoarthritic lipping.

Neoplasm: None.

Traumatic: The left calcaneous, metatarsals, and phalanges exhibited extensive osteoarthritic lipping most likely associated with a healed crushing injury to the tarsal and phalanx of the big toe.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms folded with hands over abdomen; left hand over lumbar and right hand over left ilium.

Funerary Aspects

Casket Shape: Tapers toward the feet.

Casket Measurement: 214 cm long; 56 cm wide at head; 48.5 cm at center; 30 cm at feet.

Casket Hardware: A diversity of components were observed with this burial. Cast white metal casket handles are identical to those found with Burial 70. Lid fasteners appear to belong to both the casket and an outside box or vault. Fasteners associated with the casket are like those found with Burial 70. Another type is like that found with Burial 31. The use of these two types of fasteners is also observed for Burial 48, another with a bust window. Perhaps the one type of fastener is used for a cover on the window. A cast thumbscrew (Figure 5-51) was probably used to secure the lid of an outside box.

A two-piece cast ornament was recovered in the thoracic area (Figure 5-52). One like this was recovered with Burial 31. The function of this object is unknown at this time. In the upper thoracic region a cast white metal plaque with the words "At Rest" was also recovered. This is like one found with Burial 70. Two wing shaped pieces of plate glass were found extending from the top of the skull to the elbows. This bust window was two layers thick.

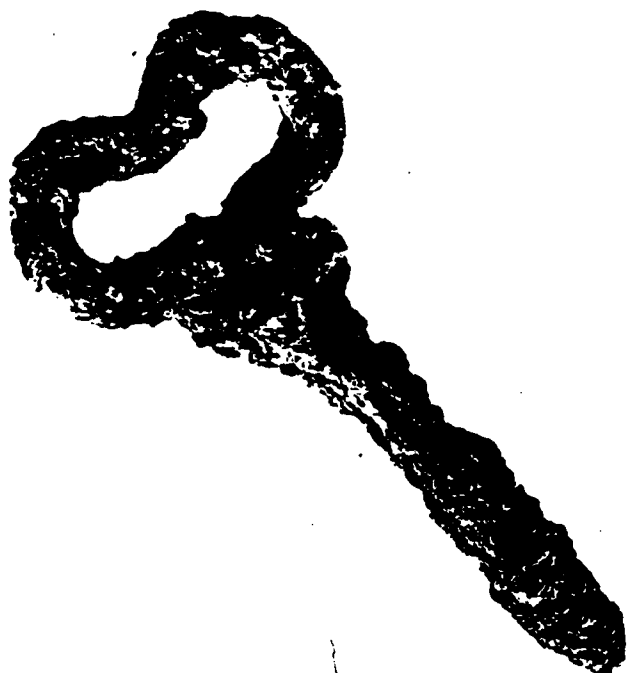
Other materials associated with the casket are nails, tacks, and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: The only cultural materials that could have been associated with clothing or a burial shroud are pieces of black fabric lined with brown found in the thoracic and foot areas (Table AXV).

PROPOSED BURIAL DATE

None of the artifacts recovered permit a determination of interment date. It is proposed that this burial is approximately contemporaneous with others in which identical casket hardware was used, but it is unknown how long such hardware was available and the length of time that a coffin maker used the same types of hardware for various caskets. The burial probably dates ca 1890-1927.



67

Figure 5-51 Lid fastener from Burial 67 (AAS 823432).



67

Figure 5-52 Two-piece ornament from Burial 67 (AAS 832248).

BURIAL 68

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 40-49 years.

Sex: Male.

Race: Fragmentation of the face prevented estimation of genetic affiliation.

Preservation

Condition: Good preservation and normal articulation.

Inventory: The face was fragmented, while the remainder of the skeleton was complete.

Paleopathology

Dental: The maxillary right incisors were lost premortem while one abscess and no caries were observed. All mandibular incisors and canines were lost premortem. This pattern of tooth loss cannot be attributed to caries or other disease processes and most closely resembles traumatic loss from a fight or accident.

Infectious: None.

Developmental: The cranial surface showed evidence of healed porotic hyperostosis, while cribra orbitalia in a healing state was observed in the orbits. These lesions indicate a previous case of anemia. The muscle attachment areas of the humeri are extremely developed and suggest the long term use of crutches (see below).

Degenerative: All articular facets of the cervical vertebrae showed extensive osteoarthritic lipping, while the thoracic and lumbar vertebrae showed moderate to severe osteophytosis. The sacrum was partially fused to the ilia by extensive osteophytosis. The left patella, tarsals, metatarsals, and phalanges all showed extensive osteoarthritic lipping. The extensive arthritic degeneration could be related to the use of crutches. The inferior articular facets of left ribs 9, 10, and 11 and right ribs 9 and 10 are flattened and mushroomed. These lesions could be due to trauma or extensive osteophytosis.

Neoplasm: None.

Traumatic: The right femur had been amputated at the midshaft (Figure 5-53). The unremodeled saw marks and absence of bone remodeling indicates death shortly after the operation. The well developed humeral muscle markings and arthritis of the spine and left leg suggests a chronic problem with the right leg and the use of

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CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY

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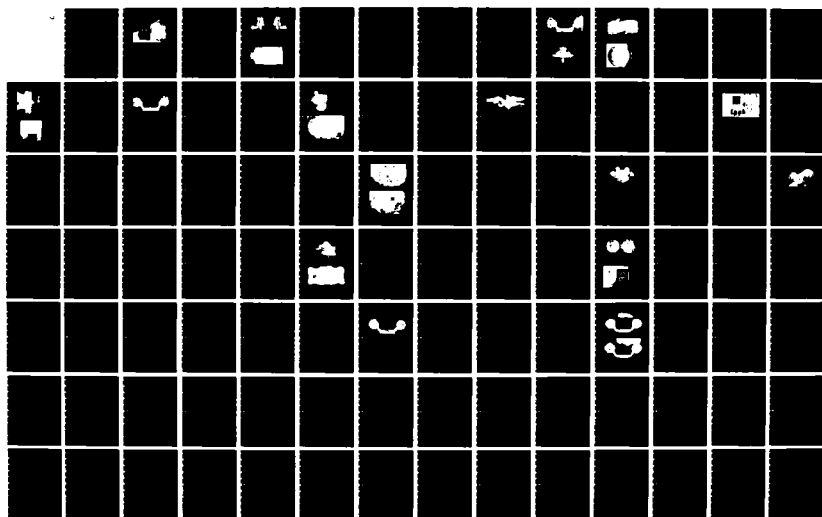
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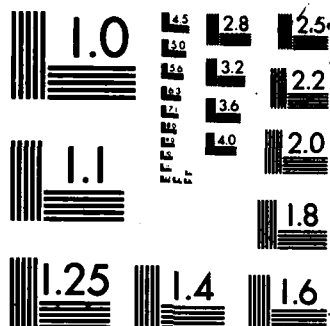
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Figure 5-53 Amputated right femur from Burial 68 showing saw marks (AAS 8 32264).

crutches. This scenario cannot be proved and amputation as the outcome of a trauma or acute infection remains a possibility.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended at sides with hands down by femur heads.

Funerary Aspects

Casket Shape: Tapers toward head.

Casket Measurements: 214 cm long; 35 cm wide at head; 46 cm wide at center; 51 cm wide at foot.

Casket Hardware: Bar type casket handles were found consisting of metal and wood parts (Figure 5-54). The wooden bar passed through the two swivel arms and had cast white metal knobs at each end. No other burial exhibits this type of handle. Two piece cast metal casket ornaments like those with Burial 31 were also found (Table AXIV). A large metal plaque was found in the pubic area which exhibits an elaborate floral border, but no lettering was visible. Other casket components included nails.

CULTURAL CHARACTERISTICS

Clothing Components: These were restricted to three buttons of white synthetic material. The buttons have four holes through concave centers. The buttons were found in the thoracic region, and may have been associated with a shirt. Dating information for synthetic buttons is presented with Burial 24. Two white metal cufflinks were also found, but no information can be provided for the dating of these.

Nonpersonal and Related Goods: Fragments of egg shell were found left of the cranium. Information on the use of eggs is presented with Burial 14. One metal flask was also found to the right of the cranium (Figure 5-55). It exhibits a screw on cap with several perforations in it, and a portion of a paper label with the letters SRV and BO. The container is most similar to talcum powder or borated talcum cans. Talcum powder was first marketed in 1890 in a pasteboard drum (Clark 1977:78). Since this leaked, a tin container was soon designed with a cap fitted over a revolving sprinkler top. Clark (1977:78) states:

Mennen advocated using his borated talcum powder in the nursery, but other brands were recommended as relief for a large variety of minor illnesses. Talcum powders were also



68

Figure 5-54 Bar handle from Burial 68 (AAS 832258).



68

Figure 5-55 Possible talcum powder can from Burial 68 (AAS 823745).

sold as perfumers and face powders. Sometimes medicinal and cosmetic properties were combined.

Most containers with ornate decorations date ca 1900-1925; later designs became simple and less ornate. This container could have been used by the deceased individual and was included as part of his possessions, or it could have been used by the undertaker and accidentally got placed or left in the casket while the body was being prepared for burial.

One prehistoric pottery fragment was found in the grave fill and was probably introduced as the grave shaft intruded through the prehistoric site.

PROPOSED BURIAL DATE

The artifacts found with this burial could have been produced and were available in the 1890s, including celluloid buttons, talcum powder cans, and so forth. Even the bar type casket handle was introduced in the late nineteenth century (Habenstein and Lamers 1975:275). These cultural materials continued in use into the early twentieth century, suggesting that burial could have occurred ca 1890-1927. This would place interment contemporaneously with other burials in this area.

BURIAL 69

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation and disarticulation of all small bones.

Inventory: Fragmentation of skull, vertebrae, ribs, hands, and feet, while the long bones were complete.

Paleopathology

Dental: Normal dental development.

Infectious: The radii showed shaft expansion and healed periostitis indicating healed infection. The femora and tibiae all showed active periostitis. The endocranial surfaces of the occipital, parietals,

temporals, and basio-cranium all showed active periosteal apposition. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia indicates anemia, while exaggerated curvature of the femora suggests rickets.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 95 cm long; 24 cm wide at head; 34 cm wide at shoulders; 20 cm wide at foot.

Casket Hardware: Nails and a fragment of a steel or iron band were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two white porcelain buttons with four holes through concave centers were found in the thoracic region (Table AXV). These were probably associated with a gown. A brass safety pin was found under the left rib cage. Dating information for these materials is presented with Burial 17.

PROPOSED BURIAL DATE

The artifacts present with this infant burial are like those found with most other infant burials in this area. They do not provide significant insights for determining the date of interment, although it has been suggested that ca 1890-1927 is probably the period of burial.

BURIAL 70

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 50+ years.

Sex: Female. The postcranial and pelvis morphology indicate a female sex, while the cranial discriminant formula (Giles and Elliot 1962) indicates a marginal male.

Race: The presence of well developed nasal gutters, broad nasal aperture, and alveolar prognathism all indicate African genetic affinities. The Giles and Elliot (1962) discriminant formula for females placed this individual just across the black boundary into the American Indian range of variation. These data suggest an African genetic heritage with American Indian admixture.

Preservation

Condition: Good preservation with disarticulation of the thorax and arms, even large long bones were reversed.

Inventory: The entire cranial and postcranial skeleton was present.

Paleopathology

Dental: Five maxillary teeth were lost premortem and five caries were observed. Six mandibular teeth were lost premortem and no caries were observed.

Infectious: Both tibiae and fibulae exhibited mild striations and pits indicating a previous healed infection.

Developmental: None.

Degenerative: The cervical vertebrae exhibited initial osteophytosis, while thoracic vertebrae 11 and 12 and all lumbar vertebrae displayed extensive osteoarthritic lipping of the articular facets. Thoracic vertebrae 8, 9, 11, and 12 had Schmorl's nodes. These lesions indicate severe back stress. The right humerus head had slight osteoarthritic lipping.

Neoplasm: A button osteoma was located lingually and inferior to the mandibular left first premolar.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Indeterminate; possibly rectangular.

Casket Measurements: Approximately 225 cm long; approximately 94 cm wide.

Casket Hardware: This burial exhibited considerable diversity in the materials recovered (Table AXIV). Casket handles were secured to the wooden casket side with four nails or screws. It appears that these handles were painted or plated with silver. In the Russell and Irwin catalog of 1865, both white metal and silver plated casket handles are shown (Association for Preservation Technology 1980:333-336). The portion of the handles attached to the casket exhibited death's heads (Figure 5-56).

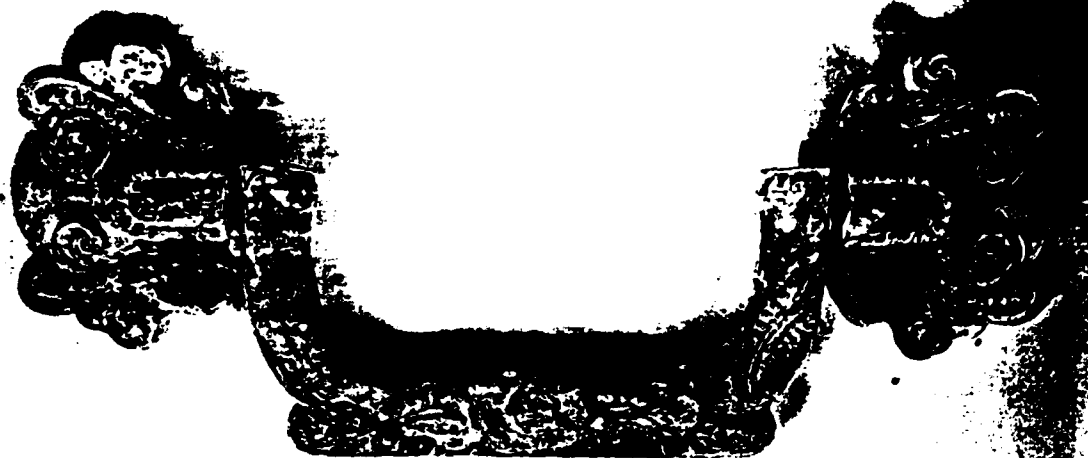
One type of lid fastener recovered is ornately decorated (Figure 5-57). This was apparently used on the casket. Two nails were used to secure the base to the casket lid. A threaded lower portion secured the casket lid to the lower box. Another lid fastener consists of wire which forms a loop, with the other end threaded. A similar example is shown with Burial 67. This was probably used to secure the lid of an outside box or vault. There were evidently no handles associated with the outside box.

A metal plaque cut in the shape of a scroll with the words "At Rest" was found in the pelvic region (Figure 5-58). Small nails were used at the upper left and lower right corners to hold the plaque to the casket.

One piece of glass was found with the burial. This may suggest the presence of a bust window, although the glass was found at the foot end of the burial. Wood casket fragments indicate that a red primer paint was used under a white finish coat.

CULTURAL CHARACTERISTICS

Clothing Components: Three shell buttons with two holes through a raised center were found (Table AXV). A fourth button was found with four holes through a concave center. These buttons were found within the thoracic region and were probably used on a blouse or dress. Dating information is presented with Burial 10. These were the only clothing artifacts found.



70

Figure 5-56 Casket handle from Burial 70 (AAS 823573).



Figure 5-57 Lid fastener from Burial 70 (AAS 823565).



70

Figure 5-58 Cast metal "At Rest" plaque from Burial 70 (AAS 823571).



70

Figure 5-59 Ceramic saucer from Burial 70 (AAS 823569).

Nonpersonal and Related Goods: A badly corroded 1897 Liberty nickel was found in the left eye orbit. Information on the use of money for the eyes is presented with Burial 33. The presence of this coin indicates that burial was during or later than 1897. One whiteware saucer with overglaze decal decorations was found under the left pelvis (Figure 5-59). There are pink roses with green petals, that are equally spaced around the rim. No maker's mark is present on the object. Decalcomania or the use of decals started in the early 1900s in Europe (Lehner 1980:13). While the first ones were put on by hand, by the mid-1930s the application was done by machine. A number of explanations could be presented to propose the presence of the saucer with the burial. One folk belief is that by placing a bowl of salt on the stomach of a corpse until it was buried would keep out evil spirits (Parler 1962:2855). A variation of this is that the salt would keep the stomach from bloating (Randolph 1951:313). Another tradition states that the cup and saucer used in the last illness should be placed on the grave to keep the deceased from returning (Parson 1923:214; Puckett 1926:104). Although no cup was found, and the saucer was within the burial or on top of the casket, there may be some relationship between the belief and the archeological evidence.

PROPOSED BURIAL DATE

The presence of shell buttons and the 1897 coin indicate that burial was necessarily more recent than 1897, while the decalcomania decoration on the whiteware saucer suggests a post-1900 burial. It is proposed that interment was ca 1900-1927.

BURIAL 77

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 25-29 years.

Sex: Male.

Race: Fragmentation of the skull prevented determination of genetic affinity.

Preservation

Condition: Good preservation with disarticulation of the thorax and shifting of the body to the right side of the casket.

Inventory: Fragmentation of the skull, vertebrae, and ribs, while the remainder of the skeleton was complete.

Paleopathology

Dental: The maxilla contained two supernumerary molars, a morphologically anomalous left lateral incisor, and seven caries. The complete mandibular dentition displayed 13 caries.

Infectious: The anterior mandibular body showed healed periostitis from a localized infection. Active periostitis was observed on the clavicles, scapulae, humeri, radii, ulnae, pelvis, femora, tibiae, fibulae, and bones of the foot. The tibiae and fibulae displayed extensive periostitis, while the remaining bones had only patches. These lesions are indicative of a spreading systemic infection.

Developmental: None.

Degenerative: Thoracic vertebrae 9, 10, 11, and 12 and all lumbar vertebrae exhibited Schmorl's nodes indicating severe back stress.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Right and left arms extended with elbows flexed and hands on abdomen.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 147 cm long; 60 cm wide.

Casket Hardware: Three cast white metal casket handles were found on each side of the body. These handles are like those from Burials 31 and 78. These handles are very similar to those found with Burial 70, but the swivel parts exhibit slight variations in pattern. Two types of lid fasteners were found. The type associated with the casket is relatively plain compared to others recovered (Figure 5-60) and is like those with Burial 24. Other lid fasteners or thumbscrews are like those with Burial 70, consisting of a heavy wire loop. These were probably used on an outside box.

A cast white metal plaque with the words "At Rest" was found. This one is very similar to the one with Burial 70. Wood casket fragments exhibited red paint. Other materials included nails, tacks, and pieces of sheet copper decorations (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Six shell buttons were found (Table AXV). Three of the buttons exhibited two holes, while the others had four holes through the center. These were probably used on a shirt. Dating information is presented with Burial 10.

Three collar and cuff studs were found. Two of the cuff studs appear to be made of white celluloid or some other early plastic and have concentric circles on the face (Figure 5-61). A bone collar stud was also recovered, very similar to the one found with Burial 15. Information on studs is presented with Burial 10. Celluloid was discovered by John Wesley Hyatt in 1869, and it was first used to imitate tusk ivory (Luscomb 1967:36). It was used well into the 1900s (see Burial 24 for additional information).

A fragment of a brass safety pin was also recovered in the general fill. Dating information is presented with Burial 17.

Nonpersonal and Related Items: Other materials recovered consist of prehistoric artifacts probably accidentally deposited or present in the grave fill (Table AXVI). These include prehistoric pottery fragments, chert flakes, and other cultural materials.

PROPOSED BURIAL DATE

Most of the artifacts with this burial provide little insight on the date of burial. The shell buttons suggest a post-1890 interment. While the casket hardware from this burial is like that from Burials 24, 31 and 70, it cannot be proposed that the burials were exactly contemporaneous. It is unknown how long the coffin builder curated casket hardware. All these burials appear to date between ca 1890-1927, with Burial 70 probably later than 1900. It is proposed this burial is also ca 1890-1927.

BURIAL 78

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 6 ± 1 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation and almost complete disarticulation.

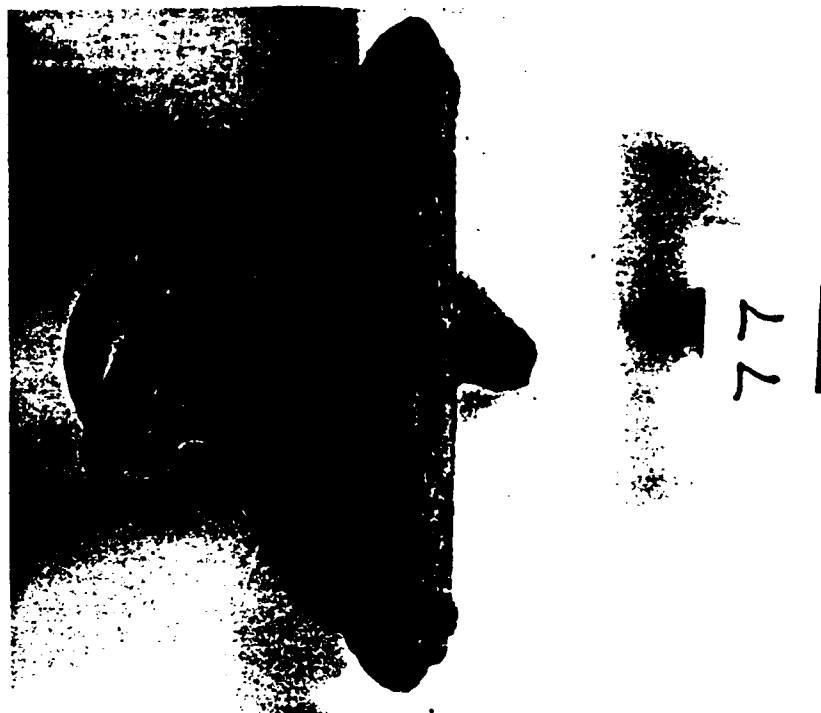


Figure 5-60 Casket lid fastener from Burial 77 (AAS 823576).

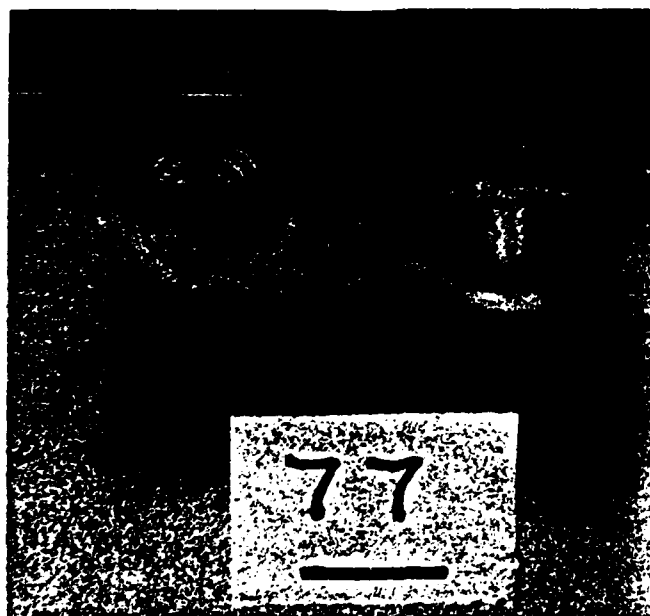


Figure 5-61 Celluloid cuff studs from Burial 77 (AAS 823574).

Inventory: Complete fragmentation of the skull, vertebrae, ribs, hands, and feet. One-half of the long bones were also fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: ESE-WNW.

Body Placement: Extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 165 cm long; 51 cm wide.

Casket Hardware: Three cast white metal handles were found on each side of the body. These handles are identical to those found with Burial 77 (Figure 5-62). Two types of lid fasteners were recovered. One ornate type is like fasteners found with Burial 77. These were apparently associated with the casket. A less ornate type of heavy wire is identical to those found with Burials 70 and 77. These were probably used to secure the lid of an outside box. Wood fragments exhibited white paint, while a chip of red paint may have been a primer on the wood. A cast white metal plaque with the words "At Rest" was found. This is a scroll type and is identical to ones with Burials 70 and 77. Other materials included tacks and nails (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Only one white porcelain button with four holes through a concave center was found (Table AXV). Dating information is presented with Burial 17.

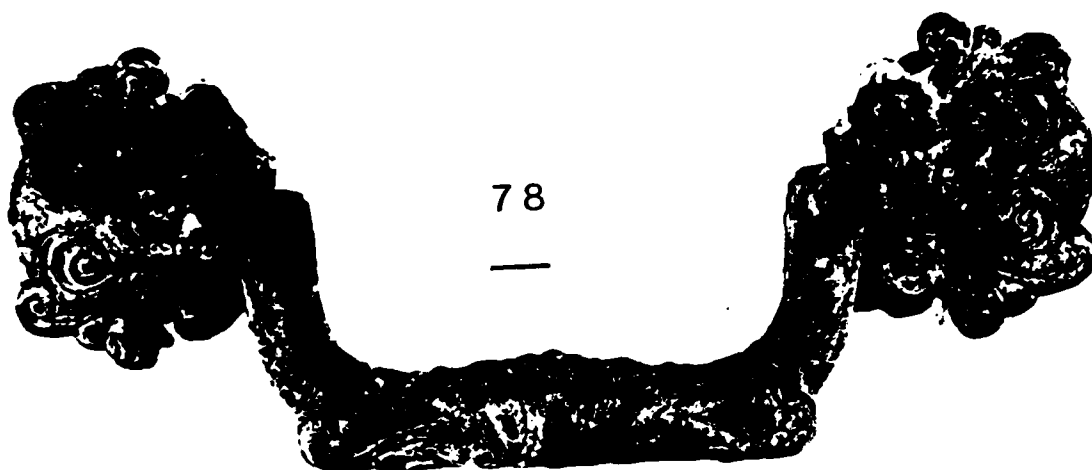


Figure 5-62 Cast metal casket handle from Burial 78 (AAS 832308).

PROPOSED BURIAL DATE

The artifacts present with this burial provide little insight on the period of burial. It is proposed that this burial was contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 79

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Adult (25+ years).

Sex: Possible female based on bone size and robusticity.

Race: Unknown.

Preservation

Condition: Poor preservation and complete disarticulation. Sometime between burial and excavation in 1982 some unknown persons removed the majority of this individual's remains.

Inventory: Five vertebrae; temporal, occipital, and maxillary fragments; three maxillary teeth; rib fragments; one-third of the sternum; fragment of the left femur; fragmentary portions of the left hand and foot were recovered.

Paleopathology

Dental: None.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: Indeterminate.

Body Placement: Indeterminate.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: One cast white metal casket handle was found. This is identical to the one recovered from Burial 29. One cast white metal lid fastener was also found (Figure 5-63). The design is unlike those observed in any other burial, and may be more recent. A portion of a cast white metal plaque with the word "Mother" was found in general fill (Figure 5-64). This is also unlike any other plaques found. Other materials include nails and tacks (Table AXIV).

PROPOSED BURIAL DATE

The only cultural materials present are a few casket components. The burial is extremely disturbed and may have been moved. The fact that the handle is most similar to those from Burial 29, and that burial appears to date ca 1900-1927 suggests this burial is also a more recent one.

BURIAL 80

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation but normal articulation.

Inventory: Fragments of the skull, vertebrae, ribs, hands and feet, while the major postcranial bones were complete.

Paleopathology

Dental: Normal dental development.

Infectious: All long bones displayed active periostitis indicating a systemic infection.

Developmental: None.



Figure 5-63 Lid fastener from Burial 79 (AAS 823752).



Figure 5-64 Cast metal plaque from Burial 79 (AAS 823750).

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Arms extended with elbows slightly flexed and hands along sides.

Funerary Aspects

Casket Shape: Possibly tapered toward feet.

Casket Measurements: 69 cm long; 33 cm wide; 12 cm from top; 30 cm wide at center; 14 cm wide at foot.

Casket Hardware: Nails and tacks were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three white porcelain buttons with four holes through concave centers were found in the thoracic area (Table AXV). These were probably associated with a gown on the infant. Fragments of three brass safety pins were also recovered, and were probably used on a diaper.

PROPOSED BURIAL DATE

None of the artifacts recovered provide significant insights on date of burial. It is proposed that this one is probably contemporaneous with others in this area (i.e., ca 1890-1927).

BURIAL 81

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 20-24 years.

Sex: Female.

Race: Unknown due to skull fragmentation.

Preservation

Condition: Poor preservation but normal articulation except the feet which were hit with the backhoe.

Inventory: The complete skeleton was recovered but the skull and many postcranial bones were fragmented.

Paleopathology

Dental: The complete maxillary dentition exhibited no caries, while the mandibular dentition produced three.

Infectious: The left tibia and right fibula displayed healed localized periostitis. The left elbow joint surfaces (i.e., distal humerus, proximal radius and ulna) showed active proliferative destruction of the surfaces (Figure 5-65). This lesion can be most likely attributed to bacterial inflammation of the synovial fluid probably associated with trauma.

Developmental: The first cervical vertebra (i.e., atlas) showed incomplete fusion of the neural arch.

Degenerative: None.

Neoplasm: None.

Traumatic: See Infectious lesion category above.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NNW-SSE.

Body Placement: Extended supine.

Hand Placement: Lower arms folded over abdomen; lower left over right arm and right hand under left forearm.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 200 cm long; 56 cm wide.

Casket Hardware: Three handles were found along each side of the body. The handles are identical to those with Burial 70. Two types of lid fasteners were found. A more ornate one is identical to fasteners



Figure 5-65 Left elbow joint of Burial 81 showing proliferative destruction of the joint (AAS 823761).

with Burial 10. A thumbscrew type is like the ones with Burial 67. These were probably used for the casket and outside box respectively. A cast white metal "At Rest" plaque was found which is like the one with Burial 70. Other materials include nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Shoes were apparently left on the feet. Remains consist of shoe heels of multiple layers of leather as well as miscellaneous shoe leather (Table AXV). Information on shoes is presented with Burial 17. One brass snap fastener was found with the burial, as well as a safety pin found under the left fibula. Dating information on snap fasteners is presented with Burial 14, and information on safety pins with Burial 17. Fragments of black fabric were also recovered on the upper thoracic region which may have come from a dress.

Personal and Related Goods: A brown hard rubber, celluloid or other early plastic comb with hair attached was found in the head area (Table AXV). This may have been used as a haircomb. Dating information on such combs is presented with Burials 33 and 39.

Two gold filled loop earrings for pierced ears were found. One was in Quadrant A suggesting that it was close to the cranium; the other was in general fill. These are very similar to the earring found with Burial 41. Dating information is presented with that burial.

PROPOSED BURIAL DATE

The cultural materials present with this burial provide little information on date of interment. These artifacts were available anytime between ca 1890 and the late 1920s, and perhaps later.

BURIAL 82

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 45-49 years.

Sex: Male.

Race: American Indian affinities. The Giles and Elliot (1962) formula for males places this individual well into the American Indian range of variation. In addition the incisors are shovel shaped, but the broad interorbital width also suggests African affinities.

Preservation

Condition: Excellent preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: Five maxillary teeth were lost premortem and 10 caries were observed. Five mandibular teeth were lost premortem and seven caries were observed.

Infectious: The femora showed healed periostitis, while the tibiae and fibulae showed shaft expansion and partially healed periostitis. These lesions indicate a healing infection of the lower limbs.

Developmental: The femora and tibiae showed abnormal anterior-posterior curvature which is suggestive of an early case of rickets.

Degenerative: All vertebrae showed mild osteophytosis, while the bones of the hands and feet all exhibited osteoarthritic lipping. These lesions indicate mild stress on the back (taking into account the age of this individual) and severe stress on the hands and feet.

Neoplasm: None.

Traumatic: The distal portion of the right ulnar shaft displayed a well healed fracture. This type of fracture is most typical of a fall when the arm is extended to absorb the shock.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended; left hand placed across pubis; right hand across head of right femur.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 190 cm long; 38 cm wide at head; 60 cm wide at shoulders; 28 cm wide at feet.

Casket Hardware: The only casket hardware consisted of nails (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four shell buttons were recovered. Two buttons had four holes through concave centers, while two had two holes through concave centers (Table AXV). These were found in the thoracic region and were probably used on a shirt. Seven buttons of synthetic material, either hard rubber, celluloid or other early plastic, were also found in the thoracic and pubic regions. Three white ones had four holes through concave centers; others were black but the number of holes could not be determined. Dating on shell buttons is presented with Burial 10; information on synthetic buttons is given with Burial 24.

A buckle was found below the ischium. This buckle is like the one recovered with Burial 44. It is proposed that this is a suspender buckle. It is possible that the rubber or plastic buttons were used to secure the suspender straps to the pants. Fragments of fabric were also found in the pubic area and in Quadrant A (Table AXV).

PROPOSED BURIAL DATE

The shell buttons suggest a post-1890 date of burial. Other artifacts provide few insights on date of interment. It is proposed this burial dates ca 1890-1927.

BURIAL 83

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 10 \pm 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and normal articulation.

Inventory: The cranium, face, ribs, vertebrae, hands, and feet were fragmented, while the remaining skeleton was complete.

Paleopathology

Dental: Five caries were observed on the deciduous maxillary dentition, while six were observed on the deciduous mandibular dentition. The four permanent maxillary incisors resemble Hutchinson's Incisors (Pindborg 1970:100), but lack the typical notching (Figure 5-66). Although this lesion suggests congenital syphilis, the

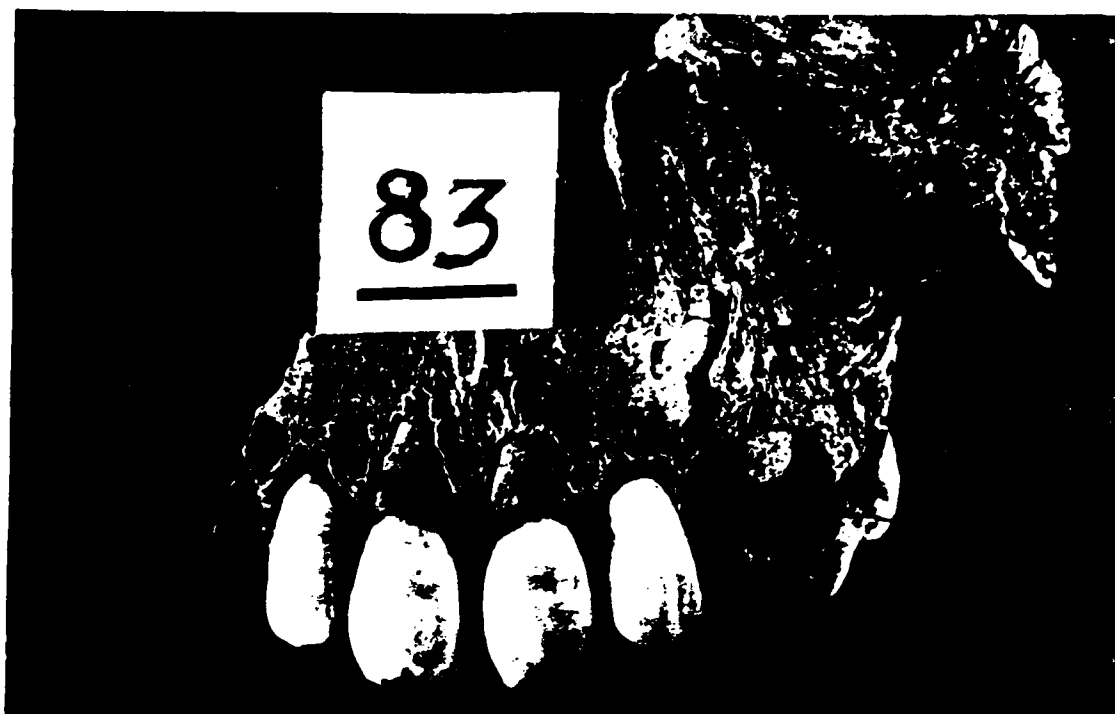


Figure 5-66 Maxillary dentition of Burial 83 showing possible Hutchinson's incisors (AAS 832330).

absence of skeletal lesions brings this diagnosis into doubt. This problem in diagnosis will be partly resolved by histological examination of the autopsy specimens.

Infectious: None.

Developmental: See dental section above.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms extended with elbows flexed and hands resting on abdominal region; left hand under right hand.

Funerary Aspects

Casket Shape: Tapers toward the feet.

Casket Measurements: 165 cm long; 57 cm wide at head; 51 cm wide at the foot.

Casket Hardware: The cast white metal casket handles are identical to those found with Burial 70. There were three along each side of the casket. Lid fasteners were also recovered and are like those with Burial 70. These suggest that there was no outside box, or if one was used there was no associated hardware. A plaque with the words "At Rest" was found in the thoracic region. No record was made if this plaque was similar to others in the cemetery, but it was probably like that with Burial 70, since this was the usual pattern observed with other burials. The wood casket fragments recovered indicated that the casket was painted white over a red primer. Other materials include nails and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three shell buttons were found. One exhibited two holes through the center, while the others had four holes through a concave center. One white porcelain button with four holes through a concave center was found over the right clavicle. Dating information is presented with Burials 10 and 17, respectively. Several brass

straight pins were found over the body, and may have been used to secure clothing. Dating information is presented with Burial 25.

Nonpersonal and Related Items: Possible egg shell fragments were found near the right shoulder in Quadrant A. The use of eggs is discussed with Burial 14.

PROPOSED BURIAL DATE

The shell buttons suggest that the burial dates to ca 1890 or later. Most of the artifacts were produced much earlier in America and do not provide significant insights for determining the period of interment. It is proposed this burial dates ca 1890-1927.

BURIAL 84

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 13 ± 3 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and disarticulation of the lower limbs.

Inventory: All parts of the skeleton were present but fragmented.

Paleopathology

Dental: One carie in a permanent maxillary molar and none in the mandibular dentition.

Infectious: None.

Developmental: The right femur shaft was larger but not longer than the left. The right tibia and fibula were larger and longer than the left counterparts. This suggests atrophy of the right side possibly associated with partial paralysis of unknown etiology.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Right humerus extended with elbow flexed; hand extended across cervical vertebrae to throat area. Left humerus abducted with left elbow flexed and hand extended across vertebrae and lower right ribs.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 202 cm long; 65 cm wide.

Casket Hardware: The cast white metal casket handles are identical to those with Burial 70. There were three handles along each side. Two types of lid fasteners were recovered. Most of these are made from cast white metal and are like those with Burial 77. An iron thumbscrew was also found like those with Burial 67. Wood fragments exhibit red paint, although this may have been the color of a primer as in other instances. Other materials included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Six white porcelain buttons with four holes through concave centers were found in the thoracic region (Table AXV). These may have been associated with a shirt. Dating information is presented with Burial 17. Fragments of black fabric were found generally in the thoracic region and around the arms. Small tacks were also found around the feet, which suggests that shoes were present with the burial.

PROPOSED BURIAL DATE

The artifacts present provide little basis for determining the date of interment. In consideration of the nature of other burials in this area, it is proposed this burial dates ca 1890-1927.

BURIAL 85

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 9 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation and completely disturbed.

Inventory: Fragments of vertebrae, ribs, teeth, left scapula, right clavicle, humeri, innominates, radii, femora, right tibia, and eight foot fragments.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis of the basio-cranium, humeri, left radius, femora, and left tibia. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia and porotic hyperostosis indicating anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Indeterminate.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 90 cm long; 37 cm wide at head; 28 cm wide at shoulder; 20 cm wide at feet.

Casket Hardware: The only materials present were nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: The only artifact present was a fragment of fabric in the upper thoracic/cranial region.

PROPOSED BURIAL DATE

There are no artifacts present with this burial which permit a determination of the date of interment. It is proposed that this burial was probably contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 86

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Female.

Race: Wide nasal aperture and interorbital breadth both indicate African genetic affinities. Because of a broken zygomatic the bizygomatic breadth was estimated using the other females and substituted into the Giles and Elliot (1962) formula for females. The calculation of genetic affinities (although unreliable because of the substitution) placed this individual well into the Black range of variation. Reduction of the bizygomatic places this individual further into the Black range, while increasing this measurement 1 cm moves this individual into the Indian range. These manipulations indicate no Indian admixture as the bizygomatic could not have been under estimated by one centimeter.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: One maxillary carie was observed. The mandibular dentition showed four caries and two teeth lost premortem.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Left and right humeri slightly abducted with elbows slightly flexed; left hand along left pelvis; right hand rests on pubic area.

Funerary Aspects

Casket Shape: Roughly rectangular.

Casket Measurements: 215 cm long; 72 cm wide at head; 70 cm wide at foot.

Casket Hardware: One cast white metal lid fastener was recovered. This is like the ones with Burial 70. Other materials included nails, tacks, and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One shell button with four holes through a concave center was found. Dating information is presented with Burial 10. A black bow with associated brass straight pins was found on the parietal. Additional fabric was found around the left clavicle and below the cervical vertebrae.

Grooming and Related Goods: A necklace was found with two types of beads. The first type consisted of white tubular glass beads, while the second included amber colored barrel shaped beads.

PROPOSED BURIAL DATE

The only artifact that provides some insights on burial date is the shell button which suggests an 1890 or more recent interment. It is proposed that the possible period of burial is ca 1890-1927.

BURIAL 87

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 45-49 years.

Sex: Male.

Race: The presence of nasal guttering and pronounced prognathism indicates an African ancestry. The Giles and Elliot (1962) formula for males places this individual into the Black range of variation.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: The maxillary dentition had two caries and four teeth were lost premortem. The mandibular dentition had four caries and five teeth were lost premortem.

Infectious: The tibiae were striated and pitted, while the left fibula showed healed periostitis. These lesions indicate a healed lower leg infection.

Developmental: None.

Degenerative: The lower cervical, thoracic, and lumbar vertebrae all showed initial osteophytosis. Thoracic vertebrae 5, 6, 7, 8, 9, 10, 11, and 12 all showed resorptive lesions of the vertebral bodies (Figure 5-67). These lesions suggest deterioration of the intervertebral discs from stress.

Neoplasm: None.

Traumatic: The left frontal showed a healed depressed fracture (Figure 5-68). Right ribs 7 and 8 exhibited healed anterior fractures. These fractures are most likely attributable to blows from interpersonal violence.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

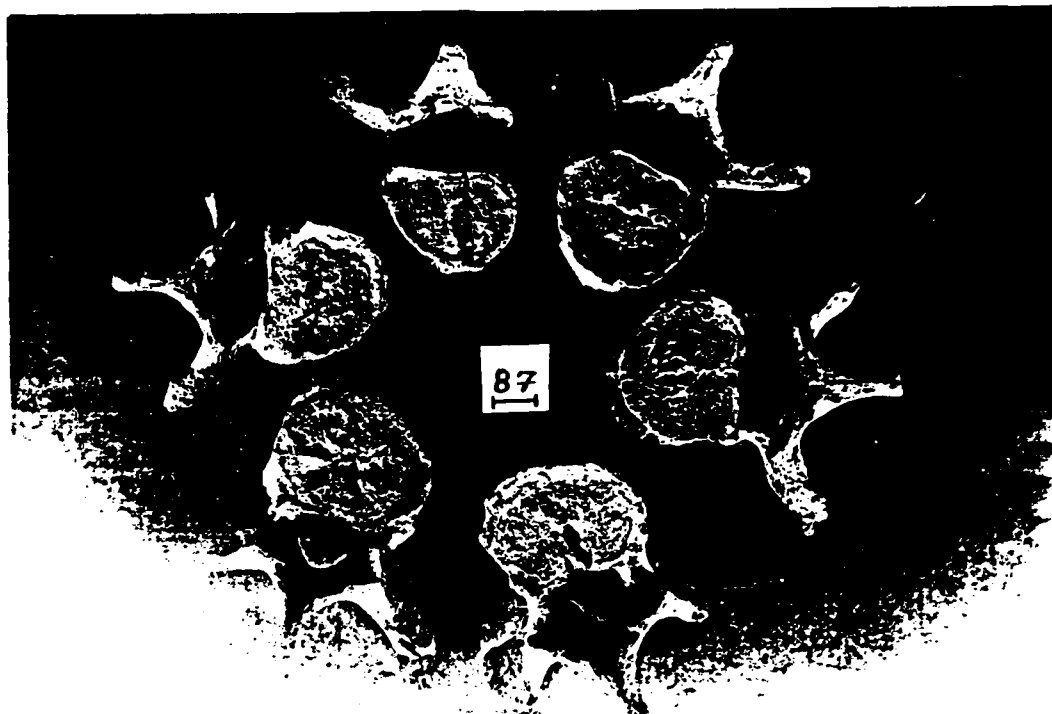


Figure 5-67 Thoracic vertebrae from Burial 87 showing vertebral body lesions (AAS 82 3531).



Figure 5-68 Skull of Burial 87 showing healed fracture of the frontal (AAS 823525).

Hand Placement: Right humerus extended with elbow flexed and hand on ilium; left humerus slightly abducted with elbow flexed and hand on right ilium.

Funerary Aspects

Casket Shape: Tapers toward feet.

Casket Measurements: 193 cm long; 53 cm wide at head; 31 cm wide at feet.

Casket Hardware: Casket handles are like those recovered from Burial 104 (Table AXIV). Two cast white metal lid fasteners were also found which are like those with Burial 70. Other materials included nails.

CULTURAL CHARACTERISTICS

Clothing Components: Three metal buttons like those with Burial 61 were found (Table AXV). These are covered with black fabric. Dating information is presented with Burial 41. A fragment of a brass safety pin was also recovered in general fill.

PROPOSED BURIAL DATE.

The artifacts present with this burial provide few insights on the possible date of burial. It is proposed that this burial would date ca 1890-1927.

BURIAL 88

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 6 ± 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and normal articulation.

Inventory: Fragmentation of the face, hands, and feet with all other skeletal components complete.

Paleopathology

Dental: Normal development and no caries.

Infectious: None.

Developmental: Healed cribra orbitalia indicating a previous case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Humeri extended with elbows flexed; right hand over left thorax; left hand over left ilium.

Funerary Aspects

Casket Shape: Roughly tapered toward feet.

Casket Measurements: 122 cm long; 36 cm wide at head; 17 cm wide at feet.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Three white porcelain buttons were found. Two of these had four holes through a concave center. One had four holes through the center and exhibited a beaded rim. Dating information is presented with Burial 17.

PROPOSED BURIAL DATE

The artifacts present provide few clues for determining the date of burial. It is proposed this burial is ca 1890-1927, like others in this portion of the cemetery.

BURIAL 89

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Male.

Race: A well developed nasal sill instead of guttering, slight prognathism, bifurcated nasal spine, and cranial shape all indicate European genetic affinities. The Giles and Elliot (1962) formula for males places this individual just across the European-Indian cutoff point into the American Indian range of variation. These data suggest a European ancestry with possible American Indian admixture.

Preservation

Condition: Good preservation and complete disarticulation of the thorax.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: The complete maxillary dentition had six caries. The mandibular dentition was missing three teeth premortem and the remainder had three caries.

Infectious: All ribs showed active periostitis primarily on the pleural surfaces, although other surfaces showed the lesion. These lesions indicate chronic pulmonary inflammation possibly tuberculosis. The radii, scapulae, and left ulna also showed active periostitis. The tibiae showed both healed and active periostitis, while the fibulae showed only remodeled lesions. These lesions indicate a chronic systemic infection. The thoracic vertebrae 9, 10, and 11 all showed reactive areas just superior to the articular facets that might be attributable to a focal infection (Figure 5-69).

Developmental: The frontal, parietals, and occipital showed remodeled pitting that might be attributed to healed porotic hyperostosis indicating a previous case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.



89

Figure 5-69 Thoracic vertebra from Burial 89 showing destructive lesion of neural arch (AAS 823484).

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Humeri extended; right hand across pelvis; left hand along leg.

Funerary Aspects

Casket Shape: Tapered toward the feet.

Casket Measurements: 210 cm long; 60 cm wide at head; 31 cm wide at feet.

Casket Hardware: Cast white metal casket handles are identical to those with Burial 47. There were three handles on each side of the casket. Lid fasteners are like those with Burial 67. Wood fragments exhibited red paint, but this may have been a primer like that observed on other caskets. Other materials included nails, tacks and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four shell buttons with four holes through concave centers were found primarily in the thoracic region (Table AXV).

Dating information is presented with Burial 10. These were the only artifacts present associated with wearing apparel or grooming.

PROPOSED BURIAL DATE

As a result of consideration of the shell buttons, it is proposed this burial could date ca 1890-1927. None of the other cultural materials provided insights on period of interment.

BURIAL 90

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 45-49.

Sex: Male.

Race: Unknown due to skull fragmentation.

Preservation

Condition: Poor preservation and extensive disarticulation of the thorax and legs.

Inventory: The skull, vertebrae, ribs, and all long bones except the humeri and ulnae were badly fragmented.

Paleopathology

Dental: Completely edentulous.

Infectious: Extensive healed periostitis of the frontals, parietals, tibiae, and fibulae indicates healed infection.

Developmental: The humerus muscle attachments were hyperdeveloped possibly due to the use of crutches (see below).

Degenerative: The right articular facets of cervical vertebrae 4 and 5 showed osteoarthritic lipping. Initial osteophytosis was observed on the lower thoracic vertebrae, while all the lumbar vertebrae displayed extensive osteophytosis which was more pronounced on the right side. All articular surfaces of both knees showed osteoarthritic lipping and eburnation. The extreme arthritic degeneration observed in this individual appears to have been the result of a locomotor disability described below.

Neoplasm: None.

Traumatic: A healed compression fracture was observed on the left frontal which was probably the result of a blow. Two adjacent phalanges were joined at their proximal ends by callus formation resulting from a healed fracture (i.e., crushing). The left femur head was completely fused to the acetabulum by bony proliferation (Figure 5-70). Although the original cause of this lesion could have been developmental, the femur head did not display any of the characteristics of Perthes' disease (i.e., porosity) or other developmental disorders (Ortner and Putschar 1981:236-242). The absence of any noticeable atrophy of the left leg suggests that this condition developed after completion of bone growth and is best attributed to trauma and subsequent repair. The hyperdevelopment of the humeral muscles suggests a fairly long use of crutches.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Humeri straight; hands probably along legs just below ilia.

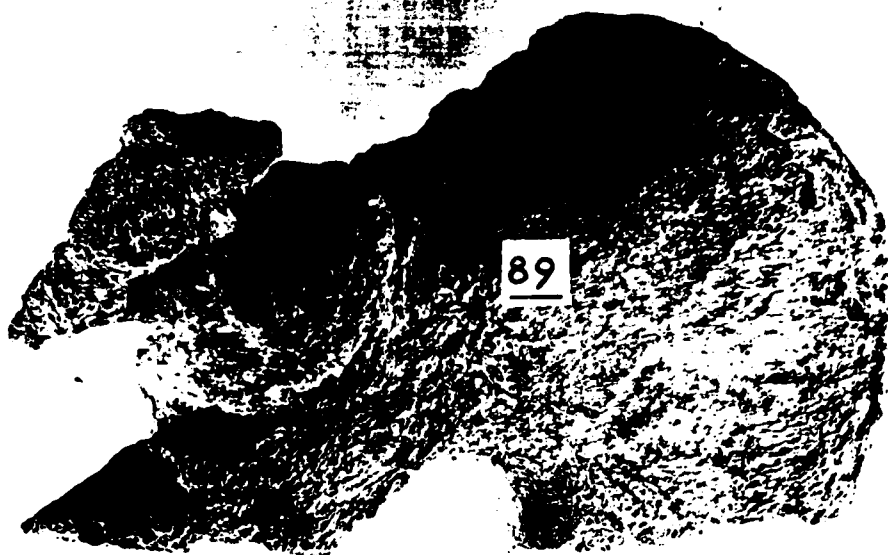


Figure 5-70 Left femur head fused to acetabulum for Burial 90 (photograph inadvertently mislabeled) (AAS 823479).

Funerary Aspects

Casket Shape: Tapered toward feet.

Casket Measurements: 189 cm long; 58 cm wide at head; tapers to somewhat rounded base.

Casket Hardware: The cast white metal casket handles are identical to those found with Burial 70 (Table AXIV). Lid fasteners were also recovered, apparently associated with the casket. These are like those with Burial 70. Other casket hardware included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two metal buttons were found (Table AXV). One of these was found below the pubic area, between the femora, and the other on top of the sacrum. Since this is a male, these may have been associated with the fly of a pair of pants. Metal buttons have been produced for a considerable time period; no attempt was made to date these cast buttons. One possible metal snap was found. Dating information for snap fasteners is given with Burial 14.

PROPOSED BURIAL DATE

Artifacts present with the burial provide little insight on the specific date of interment. If a metal snap fastener was present, the burial probably dates ca 1900-1927.

BURIAL 91

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Preservation poor and completely disarticulated by the backhoe.

Inventory: Although a complete skeleton was recovered all bones were fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis was found on all cranial fragments, ribs, humeri, radii, ulnae, pelvis, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: Indeterminate.

Body Placement: Indeterminate.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Indeterminate.

Casket Measurements: Indeterminate.

Casket Hardware: Nails were the only artifacts found (Table AXIV).

PROPOSED BURIAL DATE

There were no artifacts present that permit determination of the date of interment. The burial is probably contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 92

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 40-44 years.

Sex: Male.

Race: No morphological traits indicative of an African ancestry were observed. The Giles and Elliot (1962) male formula places this individual just across the White-Indian division point into the American Indian range of variation. These data suggest at least a European-American Indian ancestry.

Preservation

Condition: Excellent preservation with disarticulation of the skull, left shoulder, thorax, and feet.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: The complete maxillary dentition displayed two caries. The mandibular dentition showed one tooth lost premortem and six caries.

Infectious: The right tibia and fibula showed healed periostitis indicating a previous infection of the right lower leg.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Right humerus slightly abducted with elbow flexed; hand lies atop left lower rib cage; left humerus extended with elbow flexed; hand over sacrum and right ilium.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 205 cm long; 65 cm wide.

Casket Hardware: Casket handles were found that are identical to those with Burial 70; there are three handles on each side of the body. Lid fasteners, apparently used on the casket, are also like those with Burial 70. There is also a thumbscrew like fastener that may have been used on an outside box which is like those with Burial 67. A cast white metal plaque with the words "At Rest" was found in the

thoracic region. It is like the one with Burial 70. Other materials include nails, tacks and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two shell buttons were found in the thoracic region. These have four holes through the center. Dating information is presented with Burial 10. A white metal cuff stud was found in the area of the right hand. The stud is very similar to the bone collar stud present with Burial 15. A discussion of studs is given with Burial 10. No leather was preserved, but the presence of small tacks or nails around the feet suggests that perhaps shoes were buried with or on the individual.

PROPOSED BURIAL DATE

The presence of shell or pearl buttons with the burial suggests a burial date of 1890 or later. Other artifacts do not provide insight on the period of interment. It is proposed that this burial is ca 1890-1927.

BURIAL 93

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 35-39 years.

Sex: Probable Female. The pelvis is female, the pubic angle is female, the pubis is neutral, the muscle markings are male, and the Giles and Elliot (1962) sex discriminant formula places the skull just into the male range. The overall weighted mean sexuality score places this individual just inside the female range.

Race: The presence of nasal guttering suggests an African ancestry. The Giles and Elliot (1962) formula for females places this individual just inside the Black range of variation. Overall this individual appears to be of African ancestry.

Preservation

Condition: Excellent preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: The maxillary dentition was missing seven teeth premortem, had three teeth completely destroyed by caries, and had five abscesses.

The mandibular dentition had one carie and six teeth were lost pre-mortem.

Infectious: None.

Developmental: An ossified hematoma was observed on the left fibula shaft.

Degenerative: None.

Neoplasm: None.

Traumatic: The anterior body of the third lumbar vertebra showed a linear cut with traces of lead embedded in the bone (Figure 5-71). The absence of bone remodeling and the recovery of the bullet fragments within the grave indicate that this wound was the cause of death.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms crossed on abdomen; right hand over left ilium; left hand over right ilium.

Funerary Aspects

Casket Shape: Approximately rectangular.

Casket Measurements: 208 cm long; 43 cm wide at head; 40 cm wide at feet.

Casket Hardware: Cast white metal casket handles are like those with Burial 70. Lid fasteners, apparently associated with the casket, were also found. These are like those with Burial 70. A cast metal plaque with the words "At Rest" was found on the upper lumbar vertebrae. This is unlike plaques found with other burials in the area (Figure 5-72). Other materials included nails, tacks, screws, and corrugated fasteners (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: The only evidence of clothing was a piece of black fabric under the plaque.

Nonpersonal and Related Items: Lead fragments from a bullet were recovered in general fill.



Figure 5-71 Third lumbar vertebra of Burial 93 showing bullet wound in vertebral body (AAS 823710).



Figure 5-72 "At Rest" plaque from Burial 93 (AAS 832376).

PROPOSED BURIAL DATE

None of the artifacts present with the burial indicate date of interment. Although the plaque is different from those with other burials, the presence of handles and lid fasteners identical to those with other burials indicates that there is no major period of time between burials. A ca 1890-1927 time range for burial is proposed.

BURIAL 94

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-39 years.

Sex: Female.

Race: Unknown due to fragmented skull.

Preservation

Condition: Fair preservation and disarticulation of the thorax.

Inventory: Fragmentation of the ribs and face while remainder of the skeleton was complete.

Paleopathology

Dental: Three caries were observed in the maxillary dentition and three in the mandibular. All molars were abnormally small and exhibited abnormal morphology which was probably associated with agenesis of two maxillary molars and three mandibular molars.

Infectious: The left mandibular body and the lateral aspects of both tibiae exhibited healed periostitis. These lesions indicate healed localized infections.

Developmental: See dental section above.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Humeri extended with elbows flexed; left hand on left rib cage; right hand away, but probably originally on lower rib cage.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 215 cm long; 65 cm wide.

Casket Hardware: Casket handles are like those with Burial 21, while most of the lid fasteners are identical to those with Burial 77. One small cast white metal lid fastener has a base like Burial 31, but the handle portion is a new style.

A cast white metal casket ornament like that found with Burial 95 was also found in Quadrant A (Table AXIV). Another cast decoration is a plaque with the words "At Rest", which is like the one with Burial 70. Plate glass was found in the cranial and thoracic regions suggesting the presence of a bust window as in Burials 39, 48 and 67. Other materials included nails, tacks and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four shell buttons with two holes through the centers were found in positions suggesting they were used on the front of a blouse or a dress (Table AXV). Dating information is given with Burial 10.

Grooming and Related Goods: Two finger rings were found with this burial. A copper or brass ring was found on the right hand, while a gold 14K ring was observed on the left hand. It is proposed that the gold ring was a wedding band. The other ring may relate to some aspect of folk tradition. Puckett (1926:388) states that according to tradition, "heart trouble is best dealt with by wearing a brass finger ring or a silver ring about the neck." No date is proposed for these rings. Rings were stamped with 14K in the 1890s (Emmet 1969:195; Israel 1968:417), and probably much earlier. Some type of badly corroded brass pin and medal was found in the upper thoracic region. To the left of the cranium a comb was found (Table AXV). This appears to be a horn comb with a nickel plated back. Such combs are found in catalogs of the late 1890s and early 1900s (Amory 1969:935; Emmet 1969:105; Israel 1968:326). They are called dressing combs. They are not shown in a catalog of the late 1920s (Sears, Roebuck Company 1929).

PROPOSED BURIAL DATE

It is proposed that this burial dates 1890 or later, based on the presence of shell buttons and the horn dressing comb. It is also proposed that the burial was probably not as late as 1926-1927, but date of interment is undetermined. The artifacts are poor for making any exact determination of burial date.

BURIAL 95

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 30-39 years.

Sex: Female.

Race: Unknown due to fragmentation of the face.

Preservation

Condition: Poor preservation with disarticulation of the thorax, right lower leg, hands, and feet.

Inventory: Fragmentation of the face, cranium, vertebrae, ribs, and pelvis, while the long bones, hands, and feet were complete.

Paleopathology

Dental: The maxillary dentition exhibited 12 caries, while the mandibular had four with two teeth lost premortem.

Infectious: None.

Developmental: The outer table of the entire cranium is finely pitted and the cranial bones were abnormally thick (10 mm at lambda). These lesions resemble healed porotic hyperostosis indicating a previous case of anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Humeri extended with hands along ilia.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 200 cm long; 66 cm wide.

Casket Hardware: Casket handles are identical to those recovered from Burial 21. There were three handles on each side of the casket. Cast white metal lid fasteners for the casket are like those from Burial 67. A two piece casket ornament ornament was found in Quadrant A (Figure 5-73). Such ornaments were found with some other burials. In the pelvic region a cast white metal plaque with the words "At Rest" was found like the one recovered with Burial 70. Plate glass from a bust window was found over the thoracic region. Other materials included nails, tacks and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two shell buttons with four holes were found in the thoracic region (Table AXV). Dating information is given with Burial 10. Three buttons of a tan synthetic material, probably plastic, were also found in the thoracic region. These were apparently attached with a metal loop that had rusted away. See Burial 24 for dating information. Black fabric was also found on the thoracic region under the glass.

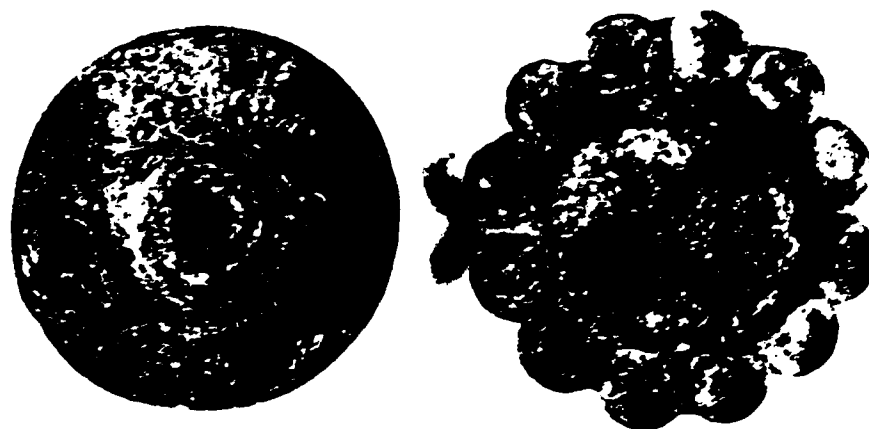
Two brass safety pins were recovered in the thoracic region. They may have been used to close a dress or blouse front, along with the buttons.

Grooming and Related Items: A ring was found on the left hand, while a gold filled earring with a threaded post and rhinestone was found in the cranial area (Figure 5-74). Earrings similar to this appear in catalogs of the early to late 1920s (Amory 1969:76; Sears Roebuck Company 1929:519).

Nonpersonal and Related Items: A 1902 dime with a drilled hole was found sewn to cloth over the right upper thorax. The same pattern was noted for Burial 43. This apparently was not a birth coin, since it appears the person was 30-39 years old at death, and the cemetery was not used after ca 1927. Use of coins is discussed with Burial 43.

PROPOSED BURIAL DATE

The presence of a 1902 coin indicates that the burial must post-date that year. None of the other artifacts necessarily indicate what date between ca 1902 and 1927 this individual was interred.



95

Figure 5-73 Two-piece ornament from Burial 95 (AAS 832392).



Figure 5-74 Earring from Burial 95 (AAS 823722).

BURIAL 96

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 45-49 years.

Sex: Male.

Race: Unknown due to fragmentation of the cranium.

Preservation

Condition: Poor preservation and disarticulation of the thorax, right shoulder, and legs. The face and left elbow were slightly disturbed by the backhoe.

Inventory: The skull, vertebrae, ribs, and most long bones were fragmented while the hands and feet were complete.

Paleopathology

Dental: Six maxillary and seven mandibular teeth were lost premortem.

Infectious: Both left tibia and fibula were striated and pitted indicating a healed infection most likely associated with a fracture (see below).

Developmental: Both right tibia and fibula evidenced ossified hematomas.

Degenerative: The cervical vertebrae exhibited marked osteophytosis, while the lower thoracic and all lumbar vertebrae exhibited initial osteophytosis. These lesions indicate severe back stress especially upon the neck. The first row of phalanges from both hands exhibited osteoarthritic lipping of their distal articular surfaces. The left patella displayed a small eroded lesion on the medial articular surface. Both femoral heads showed eroded areas on the articular surfaces, while the acetabular rims exhibited osteoarthritic lipping.

Neoplasm: None.

Traumatic: The right metatarsals were extensively remodeled at their distal ends which indicate a healed crushing injury to the right foot. The distal phalanges display extensive osteoarthritic lipping which is related to this injury. The left fibula displayed a healed fracture of the proximal shaft and was probably the cause of the localized infection (see above).

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Elbow bent with right hand under "At Rest" plaque on pelvis; left elbow appears flexed with hand under plaque.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 200 cm long; 50 cm maximum width; 30 cm wide at feet.

Casket Hardware: Handles from the casket were found which are identical to those from Burial 21. Three handles were found on each side of the body. Two types of lid fasteners were found. The ornate type, which predominates, is like that with Burial 67. A thumbscrew type is like those with Burial 70. The latter may have been associated with an outside box, while the former were used to secure the casket lid. A plaque with the words "At Rest" was found in the pelvic region. This is identical to the one found with Burial 70. Fragments of glass were also present in the cranial and thoracic region suggesting use of a bust window. Other material included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four bone buttons with four holes through concave centers were found in the thoracic region (Table AXV). Dating information is presented with Burial 10. These were probably used on a shirt. White porcelain buttons with four holes through concave centers were also found in the thoracic region. Information is given with Burial 17. One button of white plastic was found by the left wrist. See Burial 24 for information on dating. One piece of fabric with a brass snap was recovered; this may be a fragment of clothing. Dating information on snap fasteners is presented with Burial 14. What may be some type of cufflink or stud was found under the right forearm. This is a white metal link consisting of two small spheres joined by a curved bar. No date is proposed.

Nonpersonal and Related Goods: One deer premolar was found in the grave fill. Its presence is probably accidental and was introduced when the grave shaft intruded the underlying prehistoric site.

PROPOSED BURIAL DATE

The presence of snap fasteners suggests a post-1900 date of burial. Other artifacts, although made earlier than that time, do not contradict a time range of ca 1900-1927.

BURIAL 97

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 50+ years.

Sex: Probable male (insufficient data for confirmation).

Race: Unknown due to missing skull.

Preservation

Condition: Poor preservation with disarticulation of thorax and pelvis. All skeletal components superior to a line drawn from the right shoulder to the left ilium had fallen into the river.

Inventory: The fragmentary remains included: a few rib fragments, the lumbar vertebrae, right clavicle, right humerus, right radius and ulna, both innominates, and both legs. The right hand and both feet were recovered.

Paleopathology

Dental: None.

Infectious: Both the left femur and fibula exhibited small patches of healed periostitis indicating previous healed localized infections.

Developmental: None.

Degenerative: The lumbar vertebrae exhibited initial osteophytosis, active resorptive lesions of the bodies, and Schmorl's nodes on the first and fifth lumbar vertebrae. These lesions indicate excessive back stress. The right ulna and radius exhibited osteoarthritic lipping of the articular surface of the distal radius. The navicular of the right wrist showed a small resorptive lesion of the articular surface. The right and left patellae displayed resorptive lesions of the lateral facets. The left femur showed lipping of the distal articular surfaces. Both tali exhibited resorptive lesions and osteoarthritic lipping of the articular surfaces, while both calcanea showed only lipping. The distal articular surfaces of all metatarsals exhibited destructive lesions. The single best diagnosis of these lesions is adult rheumatoid arthritis (Ortner and Putschar 1981:403-411).

Neoplasm: None.

Traumatic: The metacarpals 4 and 5 of the right hand exhibited callus deposit indicating a healed crushing fracture. The metatarsals 3 and 4 exhibited calus formation from a healed crushing fracture of the right foot. These lesions suggest healed traumas to the right hand and foot which resemble a "dropping" industrial accident.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 80 cm long, 60 cm maximum width; 47 cm wide at feet.

Casket Hardware: The handles are like those with Burial 21, while lid fasteners are similar to that with Burial 70. Three handles were found on each side. Fragments of a plaque were found, but it was too fragmentary to determine its shape and other aspects (Table AXIV). Other materials included nails and screws. Wood fragments exhibited white paint over a red primer.

CULTURAL CHARACTERISTICS

Clothing Components: Three shell buttons with four holes through sunken centers were found atop the sacrum. They may have been used on trousers.

PROPOSED BURIAL DATE

On the basis of the shell buttons, it is proposed that this burial dates ca 1890-1927. None of the other artifacts provide insight on the date of burial.

BURIAL 100

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 10 ± 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Good preservation and disarticulation of the skull, thorax, left leg and left arm.

Inventory: Fragmentation of the face, but complete recovery of the remainder of the skeleton.

Paleopathology

Dental: Normal dental development.

Infectious: None.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Perhaps right hand crossed on abdomen.

Funerary Aspects

Casket Shape: Slightly tapered to feet.

Casket Measurements: 160 cm long; 28 cm wide at head; 24 cm wide at feet.

Casket Hardware: Only nails, a screw, and tacks were found (Table AXIV). The decorative tack is like the one from Burial 85.

CULTURAL CHARACTERISTICS

Grooming and Related Items: Numerous beads were found between the cranium and mandible region. Most of these are tiny hexagonal tubular beads. Two black barrel shaped beads were also found. Some of these beads are like those with Burial 39. See Burial 39 for discussion.

PROPOSED BURIAL DATE

None of the artifacts provide significant insights to permit determination of the date of burial. It is assigned to ca 1890-1927 on the basis of proposed contemporaneity with other nearby burials.

BURIAL 101

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 10 \pm 2 years.

Sex: Biologically unknown but the clothing components (discussed below) suggest that this individual is a male.

Race: Unknown.

Preservation

Condition: Good preservation with disarticulation of the thorax, shoulders, arms, and pelvis. The face and skull were fragmented by the backhoe.

Inventory: Fragmentation of the cranium, face, and ribs with the remainder of the skeleton complete.

Paleopathology

Dental: Normal dental development with two mandibular caries.

Infectious: The anterior surfaces of the thoracic and lumbar vertebrae exhibited remodeled resorptive lesions of unknown etiology.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Left arm extended with elbow flexed; right arm extended with elbow flexed; hands scattered, probably placed on pubic area.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 170 cm long; 35 cm wide at head; 52 cm wide at shoulder; 28 cm wide at feet.

Casket Hardware: Only nails and decorative tacks were found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two shell buttons with four holes through concave centers were found in the thoracic region. Dating information is given with Burial 10. Metal buttons predominated. Many of these are badly corroded. Three of them were in the pubic region, and were probably fly buttons on the trousers. Five other buttons were painted black and exhibited stamped cross-hatching. It is proposed these were probably buttons attached to the pants to secure suspenders. Similar buttons were found with Burial 44, an adult male. Also found with both burials is a buckle, apparently used to secure suspender straps.

Nonpersonal and Related Items: A circular metal object was found over the feet that could not be identified. A portion of a ring was attached to one side of the 14 cm diameter disk.

PROPOSED BURIAL DATE

Based on the shell buttons and metal suspender buttons, it is proposed this burial dates ca 1890-1927. The absence of other diagnostic artifacts prevented refinement of the dating.

BURIAL 102

BIOLOGICAL CHARACTERISTICS

Demographics

Age: The complete fusion of all cranial sutures suggests an age of 50+ years.

Sex: Probable female. All morphological traits are either female or neutral but the absence of the pubic bones makes sexing uncertain.

Race: Unknown.

Preservation

Condition: Poor preservation with disarticulation of the shoulders, thorax, and legs at the knees.

Inventory: Fragmentation of the skull, vertebrae, ribs, pelvis, and most long bones. The feet were complete while the hands were only partially recovered.

Paleopathology

Dental: There was one carie and 14 teeth lost premortem in the maxillary dentition. There were two caries and seven teeth lost premortem in the mandibular dentition.

Infectious: The maxillary alveolar bone exhibited active periostitis attributable to periodontal disease. Healed periostitis was observed on both femora, both fibulae, and the left tibia. The right tibia exhibited remodeled pitting and striations. These lesions indicate a healed infection of the legs. A small healed resorptive cranial lesion was observed at Bregma.

Developmental: None.

Degenerative: All bones of the hands and feet exhibited extensive osteoarthritic lipping of the articular surfaces. The sacro-iliac joints were fused by bony proliferation. All lumbar and the lower cervical vertebrae exhibited marked osteophytosis. One set of three and two sets of two thoracic vertebrae exhibited ossified connective ligaments. The best single diagnosis for these lesions is aklylosing spondylitis (Marie - Strumpell's disease) (Ortner and Putschar 1981:411-420).

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms to side; right hand right of right ilium; left hand below left ilium between femora.

Funerary Aspects

Casket Shape: Roughly rectangular.

Casket Measurements: 210 cm long; 66 cm wide at head; 58 cm wide at shoulder; 69 cm wide at feet.

Casket Hardware: Cast white metal casket handles were found that are unlike those observed with other burials (Figure 5-75). Ornamented lid fasteners, probably associated with the casket, are like those with Burial 70. A plain thumbscrew like that with Burial 67 was also found. This may have been used on an outside box. Other materials included nails, two brass bell-shaped ornaments, tacks, and screws (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One white porcelain button with four holes through the concave center was found in the thoracic region. This was probably used to secure the top of a dress. Dating information is found with Burial 17.

PROPOSED BURIAL DATE

The artifacts present do not provide an opportunity to determine the specific date of interment. It is proposed this was ca 1890-1927 as were other burials in this area.

BURIAL 103

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 20-29 years.

Sex: Female.

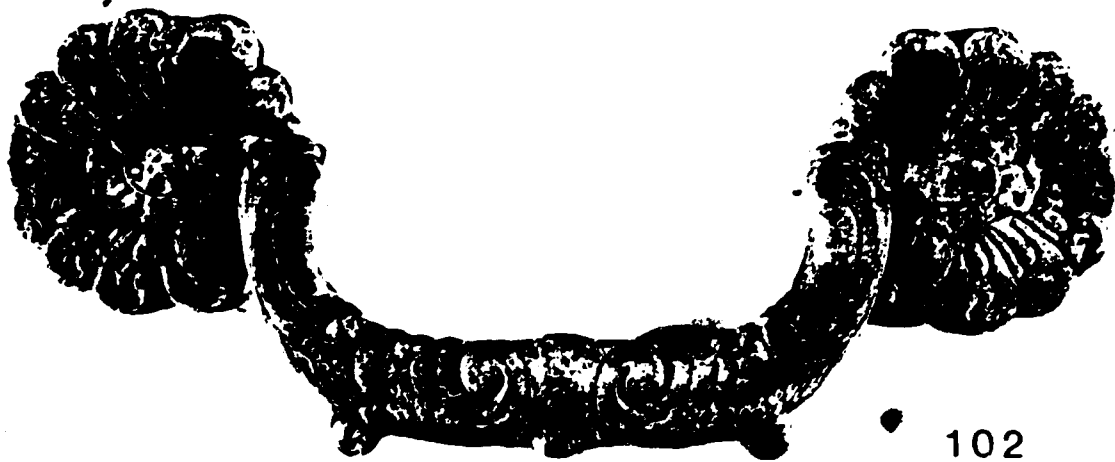


Figure 5-75 Casket handle with Burial 102 (AAS 832422).

Race: The Giles and Elliot (1962) formula for females places this individual just across the Black-Indian division point into the American Indian range of variation. This position suggests mixed American Indian and African genetic ancestry.

Preservation

Condition: Excellent preservation and normal articulation.

Inventory: Complete cranial and postcranial skeleton.

Paleopathology

Dental: No maxillary caries and one mandibular carie were observed. The right maxillary third molar was peg shaped.

Infectious: A small remodeled resorptive lesion at Bregma was observed. The right distal radius shaft exhibited active periostitis from a localized infection. Both tibiae exhibited remodeled striations and pits from a possible healed local infection.

Developmental: See dental section above.

Neoplasm: None.

Traumatic: The second left rib exhibited a healed fracture probably from a blow or accident.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Right hand over abdomen; left hand over sternum with elbow flexed.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 199 cm long; 60 cm wide.

Casket Hardware: Cast white metal casket handles are like those with Burial 102, while lid fasteners are similar to those with Burial 70. Other materials included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Shoe heels were found by the left and right feet. These were composed of layers of leather held together with metal tacks. See Burial 17 for information on shoes.

Grooming and Related Items: A gold filled loop earring for pierced ears was found by the left side of the cranium. This earring is similar to those found with Burials 41 and 43. It has an embossed decoration. Information is given with Burial 41.

PROPOSED BURIAL DATE

The artifacts provide little basis for determining the date of burial. It is proposed this burial is ca 1890-1927.

BURIAL 104

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 8 \pm 2 years.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with disarticulation of the thorax and legs. This case of disarticulation was probably due to casket collapse as the casket hardware was disoriented in the same direction as the skeleton.

Inventory: The cranium, face, ribs, vertebrae, hands, feet, and half the long bones were fragmented.

Paleopathology

Dental: Normal dental development.

Infectious: A small smooth walled lytic lesion was observed on the left tibia midshaft. Both femora and tibiae exhibited healed periostitis, while both fibulae showed only remodeled pitting and striations. These lesions indicate a healed infection of the legs.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Left arm extended; right arm extended, slightly flexed; hands disarticulated, probably along side the pelvis.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 165 cm long; 20 cm wide.

Casket Hardware: Three handles were found along each side. This is the first instance that handles of two different styles were used on the casket. The first type was found in Quadrants A, B, and D (Figure 5-76). This type was not observed with other burials. The second type was found in Quadrants C and E. This handle type was observed with Burial 55 and 87 (Figure 5-77). Cast white metal lid fasteners are like those with Burial 70. There was another smaller type of fastener which is different than those seen with other burials.

Numerous fragments of plate glass were found from a bust window. This is like the one with Burial 39. Other materials included nails and tacks (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Five porcelain buttons with four holes through concave centers were recovered in the thoracic region. Dating information is given with Burial 17. Fabric was also found below the left ilium.

PROPOSED BURIAL DATE

Artifacts present offer few insights on date of burial. The burial appears to be contemporaneous with others in the area and could be ca 1890-1927.

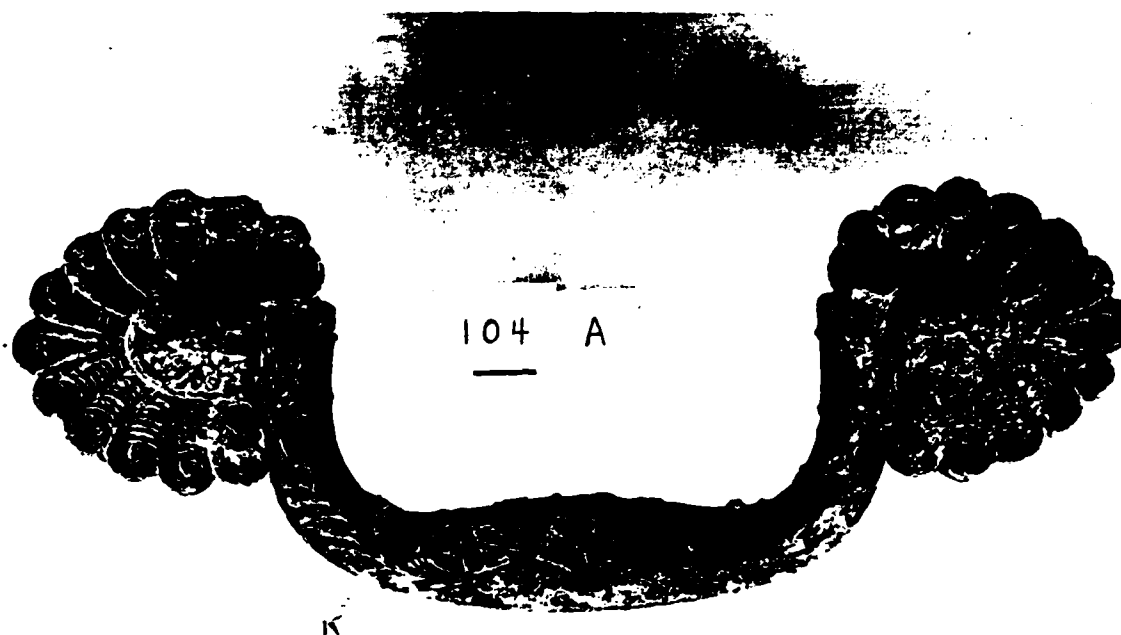


Figure 5-76 Casket handle with Burial 104 (AAS 823520).

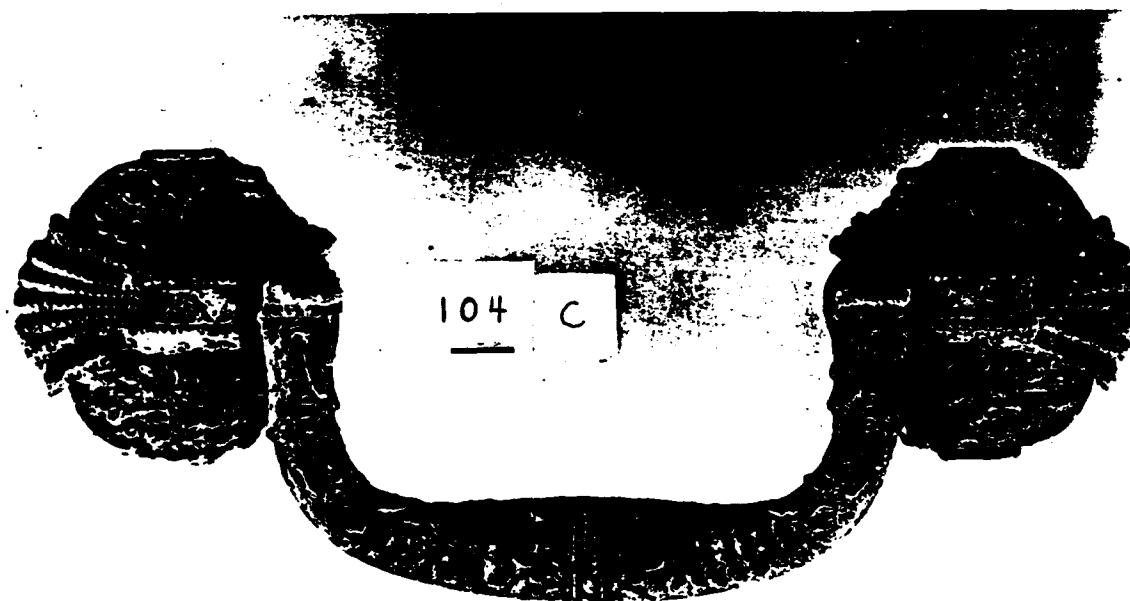


Figure 5-77 Casket handle with Burial 104 (AAS 823521).

BURIAL 105

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 6 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with normal articulation.

Inventory: The ribs, vertebrae, and skull were reduced to fragments and meal. The long bones, pelvis, hands, and feet were represented by fragments.

Paleopathology

Dental: Normal dental development.

Infectious: The outer table and endocranial surfaces of the frontal, basis-cranium, parietals, and occipital exhibited active periostitis. Active periostitis was observed on the ribs, clavicles, scapulae, pelvis, and all long bones. These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Elbow flexed with hands resting on lower rib cage.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 67 cm long; 18 cm wide at head; 18 cm wide at feet.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Numerous porcelain buttons with four holes through concave centers were found in the thoracic area and one by the feet (Table AXV). These were probably used on a long gown. Two brass safety pins were also found between the ilia. Dating information for these buttons and pins is given with Burial 17.

PROPOSED BURIAL DATE

No specific date could be determined for the burial. It is proposed this one is contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 106

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation with disarticulation of the left hand, right elbow, tibiae, and feet. The feet were disturbed by rodents.

Inventory: The vertebrae, ribs, cranium, hands, and feet were fragmented, while the remaining bones were complete.

Paleopathology

Dental: Normal dental development.

Infectious: The endocranial surfaces of the calvarium exhibited active periostitis. The basio-cranium, mandible and temporals also exhibited active periostitis. Patches of active periostitis were observed on the ribs, mandible, scapulae, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia indicates anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Elbows possibly flexed; left hand across lumbar vertebrae; right hand on left ilium.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 59 cm long; 30 cm wide.

Casket Hardware: Nails and decorative tacks were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Four porcelain buttons with four holes through concave centers were recovered in the thoracic region (Table AXV). These probably were used on a gown. A brass safety pin was also found by the left femur, probably from a diaper. Dating information is presented with Burial 17.

PROPOSED BURIAL DATE

It is proposed that this burial dates ca 1890-1927. While artifacts do not provide specific insights on dating, assemblage is like that found with other burials in the area and this burial appears to be contemporaneous with the others.

BURIAL 107

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 2 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation with normal articulation.

Inventory: The vertebrae, ribs, skull, clavicles, pelvis, fibulae, hands, and feet were fragmented, while the remaining bones were complete.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis was observed on the endocranial surfaces of the occipital, frontal, and temporals. Active periostitis was observed on the basio-cranium, mandible, ribs, scapulae, humeri, radii, ulnae, pelvis, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia indicates anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Elbows slightly flexed with hands on ilia.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 86 cm long; 10 cm wide at head; 23 cm wide at shoulder; 9 cm wide at feet.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: The most numerous cultural materials were porcelain buttons with four holes through concave centers. These were oriented down the remains as if on a long gown. A brass safety pin was also found in the pelvic region with a piece of white fabric. See Burial 17 for dating information.

PROPOSED BURIAL DATE

The artifacts provide few insights on dating, but this burial is probably contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 108

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with normal articulation.

Inventory: All bones except the clavicles, innominates, and femora were fragmented, while the hands and feet were missing.

Paleopathology

Dental: Normal dental development.

Infectious: Active periostitis was observed on the endocranial surfaces of the occipital, parietals, frontal, and temporals. Mild to moderate active periostitis was observed on the basio-cranium, mandible, humeri, femora, tibiae and fibulae. These lesions indicate active systemic infection.

Developmental: Active cribra orbitalia indicates anemia.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: SW-NE.

Body Placement: Extended supine.

Hand Placement: Right hand across upper ilium and lumbar vertebrae;
left hand over lumbar vertebrae.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 106 cm long; 18 cm wide at head; 27 cm wide at
shoulder; 13 cm wide at feet.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Porcelain buttons with four holes through concave
centers were found in the pelvic and upper thoracic regions (Table
AXV). Brass safety pins were found in the pelvic region, one of these
with a piece of white fabric. The artifacts apparently came from a
gown and diaper. Dating information is presented with Burial 17.

Nonpersonal and Related Items: Two greenish black seeds or beans were
found beneath the left ulna. These have not been identified.

PROPOSED BURIAL DATE

The artifacts found with this infant are like those found with other
infants in this area. It is proposed this burial is ca 1890-1927.

BURIAL 109

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 7 months \pm 2 months in utero.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation with normal articulation.

Inventory: Fragmented ribs, vertebrae, skull, hands, and feet with the remainder of the skeleton complete.

Paleopathology

Dental: Normal dental development.

Infectious: Extensive active periostitis was observed on all endocranial surfaces as well as the orbits, basio-cranium, mandible, ribs, and scapulae. Patches of active periostitis were observed on the humeri, radii, ulnae, pelvis, femora, tibiae, and fibulae. These lesions indicate active spreading systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Elbows slightly flexed with hands on ilia; crossed hands over lumbar vertebrae and pelvis.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 59 cm long; 13 cm wide at head; 22 cm wide at shoulders; 10 cm wide at feet.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One shell button with four holes through a concave center was found left of the lumbar vertebrae (Table AXV). More numerous were porcelain buttons with four holes found in the thoracic

region. These buttons were probably used on a gown. Dating information is given with Burial 10 for shell buttons, and Burial 17 for porcelain ones.

PROPOSED BURIAL DATE:

The artifacts are like those found with other burials in this area. The burial probably dates ca 1890-1927.

BURIAL 110

BIOLOGICAL CHARACTERISTICS

Demographics

Age: Birth \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation and normal articulation.

Inventory: The skull, vertebrae, ribs, hands, and feet were fragmented, while the remaining skeleton was complete.

Paleopathology

Dental: Normal dental development.

Infectious: Endocranial surfaces of all cranial bones exhibited active periostitis. The clavicles and scapulae exhibited patchy periostitis, while extensive active periostitis was observed on the ribs, humeri, radii, ulnae, pelvis, femora, tibiae, and fibulae. These lesions indicate active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Arms flexed with hands crossed upon abdomen.

Funerary Aspects

Casket Shape: Rectangular.

Casket Measurements: 79 cm long; 28 cm wide.

Casket Hardware: Nails were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two brass safety pins were found between the femora. These apparently were associated with a diaper. Dating information is given with Burial 17.

PROPOSED BURIAL DATE

As a result of the sparsity of diagnostic artifacts, it cannot be determined when this infant was buried. It is proposed that the burial date was ca 1890-1927.

BURIAL 111

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with entire skeleton disarticulated by rodents.

Inventory: The skull, vertebrae, ribs, hands, and feet were fragmented, while the remainder of the skeleton was complete.

Paleopathology

Dental: Normal dental development.

Infectious: Both endocranial and ectocranial surfaces of all cranial bones showed active periostitis. The thoracic and lumbar vertebrae exhibited active resorptive lesions on the anterior surface of the vertebral bodies. The ribs, clavicles, scapulae, radii, ulnae, humeri, pelvis, femora, tibiae, and fibulae all showed patches of active periostitis. These lesions indicate an active systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: NW-SE.

Body Placement: Extended supine.

Hand Placement: Hands possibly across the vertebral column.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 101 cm long; 16 cm wide at head; 25 cm wide at shoulder; 10 cm wide at feet.

Casket Hardware: Nails and decorative tacks were the only material found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Porcelain buttons were the primary artifact recovered (Table AXV). These have four holes through concave centers. They were found in the thoracic region. A fragment of black fabric was also found by the left humerus. Only one brass safety pin was found. This was by the right femur. Dating information is presented with Burial 17 for both buttons and pins.

PROPOSED BURIAL DATE

This burial is probably contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 112

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 3 months \pm 3 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Poor preservation with complete disarticulation by the backhoe from the pelvis to the feet.

Inventory: The following fragmentary remains were recovered: vertebrae, ribs, skull, scapulae, clavicles, humeri, left radius and ulna, and the pelvis.

Paleopathology

Dental: Normal dental development.

Infectious: Possible active periostitis was observed on the basiocranium. Patches of active periostitis were observed on the left humerus, radius, and ulna. These lesions indicate a possible beginning systemic infection.

Developmental: None.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: Perhaps NW-SE.

Body Placement: Indeterminate; perhaps extended supine.

Hand Placement: Indeterminate.

Funerary Aspects

Casket Shape: Indeterminate; perhaps rectangular.

Casket Measurements: Approximately 70 cm long; 38 cm wide.

Casket Hardware: Nails and a wood casket fragments were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: One white plastic button with four holes through a concave center was found in the upper thoracic region (Table AXV). This may not represent all of the artifacts originally present. Dating information is presented with Burial 24.

Nonpersonal and Related Items: A prehistoric pottery fragment was recovered from the gravefill, where its presence indicates grave intrusion through the prehistoric site.

PROPOSED BURIAL DATE

This burial is probably contemporaneous with others in the area (i.e., ca 1890-1927).

BURIAL 114

BIOLOGICAL CHARACTERISTICS

Demographics

Age: 18 months \pm 6 months.

Sex: Unknown.

Race: Unknown.

Preservation

Condition: Fair preservation with disarticulation of the thoracic region and arms.

Inventory: The skull, vertebrae, ribs, hands, and feet were fragmented, while the remainder of the skeleton was complete.

Paleopathology

Dental: A severe neonatal hypoplastic episode was observed on all appropriate teeth. The deciduous molars were anomalous, resembling the Mulberry permanent molars of congenital syphilis.

Infectious: None.

Developmental: Cribra orbitalia indicates active anemia. The marked diploic expansion and pitting of the frontal suggests porotic hyperostosis. These lesions suggest craniotabes (rickets) or anemia. These lesions, alone, cannot differentiate between the two syndromes.

Degenerative: None.

Neoplasm: None.

Traumatic: None.

MORTUARY CHARACTERISTICS

Physical Aspects

Body Orientation: W-E.

Body Placement: Extended supine.

Hand Placement: Arms extended with hands along each ilium.

Funerary Aspects

Casket Shape: Diamond.

Casket Measurements: 190 cm long; 45 cm wide at shoulder.

Casket Hardware: Nails, tacks and an unidentified fragment of metal were the only materials found (Table AXIV).

CULTURAL CHARACTERISTICS

Clothing Components: Two shell buttons were found. One exhibited four holes and the other two holes through concave centers. These were in the upper thoracic region and were probably used on a gown. Dating information is presented with Burial 10. White porcelain buttons with four holes through concave centers were slightly more abundant (Table AXV). One of these was also in the upper thoracic region. Between the ilia one brass safety pin with white fabric was recovered. Dating information for the porcelain buttons and pin is presented with Burial 17.

Nonpersonal and Related Items: One prehistoric pottery fragment was found within the grave fill and was probably introduced when the grave intruded the prehistoric site.

PROPOSED BURIAL DATE

Based on the presence of shell buttons, it is proposed this burial was conducted no earlier than ca 1890. It may have been as recent as 1927. The artifacts provide few clues to determine specific date of interment.

Chapter 6

CEDAR GROVE BURIAL INTERPRETATION

by Jerome C. Rose and Lawrence Gene Santeford

INTRODUCTION

This chapter presents a discussion of the required topical research domains for the excavated portion of the Cedar Grove historic cemetery, including mortuary practices, demography, paleopathology, and genetic affinity. The realized and potential contributions of the Cedar Grove sample to the broad area of Black American history, archeology, and biology is presented in the following chapter. The excellent state of preservation and large sample size which produced complete and extensive osteological and cultural data sets require detailed computer assisted analyses which are proposed for the future using the preliminary results presented here as guide (see Appendix V).

This chapter first offers an interpretation of the Cedar Grove mortuary behavior focusing on its patterning by age, sex, and spatial location within the cemetery. Next the demographic section considers the question of how representative is the skeletal sample of the Cedar Grove community. Third, the paleopathology section provides preliminary diagnoses of the skeletal lesions while attempting a preliminary interpretation of the pattern of skeletal lesions within the sample. The possible genetic affinities of the sample are considered, and finally a brief discussion of skeletal disarticulation and grave disturbances is presented.

Before beginning the discussion of the results, the chronological position of the excavated portion of the Cedar Grove cemetery must be clarified. Since no archeological evidence emerged which established a single date of interment prior to 1890, the chronological range of this sample is considered to be from 1890 to 1927 when the cemetery was covered by silt. Future research on the chronology of the casket hardware may produce earlier dates, but it is extremely doubtful that more than ten years would be added to the chronology. It was originally hoped that fairly precise interment dates could be established, but this was not the case. Even if this is accomplished for the adults, the subadults with their meager collections of cultural material will remain undifferentiated. Consequently, for the purposes of this analysis the skeletal collection is considered a single mortuary sample from 1890 to 1927.

MORTUARY PRACTICES

In Chapter 5 the descriptions of the burials in the Cedar Grove Cemetery were presented in numerical order without reference to age, sex, or spatial distribution. In this section interpretations are presented based on ordering the burials by these three factors. In this way some preliminary statements can be made about burial patterns, presence of artifacts, and other aspects. Six age groups are used to divide the population: infant (0-2 years old); children (2-13 years old); adolescent (13-20 years old); young adult (20-30 years old); middle-aged adult (30-50 years old); and older adult (50+ years old). Specific artifact listings by burial number are provided in Appendix III Tables AXIV, AXV, and AXVI.

Infant (0-2 years)

Thirty-two burials were infants, all of which were buried in extended supine positions. Most were oriented with the head to the west or northwest with only Burial 91 indeterminate due to disturbance. Four casket shapes were observed: diamond (12 caskets), rectangular (11 caskets), tapered toward the feet (three caskets), tapered toward the head (one casket), and indeterminate (five caskets). None of the burials exhibited casket handles or lid fasteners associated with the remains. None of the burials exhibited evidence of bust windows. Nails were found with all burials. Eight burials contained lining tacks, with an additional five having other decorative tacks. These caskets may have been lined, although other evidence is lacking. Presence of tacks does not relate to shape of casket. Only Burial 33 contained a cast white metal plaque. This plaque is like one found with Burial 70. Burial 33 is on the east edge of a larger cluster of child and adult burials that contain such plaques (Table 6-1), in the north central portion of the area excavated. Burial 33 casket components do not appear to be unique except for the plaque. It is, however, distinct in being the only infant burial having a comb and coins present within the casket. The presence of such artifacts generally appears to be reserved for adults. One coin has the date 1889 and the other 1907. The presence of the latter coin definitely indicates the earliest year this infant could have been interred. The date of other infant burials could not be determined because of the absence of such diagnostic artifacts. This burial is spatially associated with 10 other infant burials that do not exhibit a similar diversity of materials.

There appear to be two distinct clusters of infant burials. The first is on the northeast side of the area examined, next to the West Muck Ditch (Figure 6-1). This consists of Burials 17, 25, 33, 34, 35, 36, 37, 38, 40, 112, and 114. These burials are adjacent to each other in a line running north-south. A second distinct cluster is present at the southwest corner of the area examined. It includes Burials 18, 105, 106, 107, 108, 109, 110, and 111. Other infant burials appear to be scattered more randomly between these clusters. It appears that the north cluster falls within an area of graves that exhibits more spatial organization. That is, graves are lined up in rows with a west-east orientation, with orderly placement north-south. Children's graves are primarily on the east edge of the large cluster. Only Burial 80 is west of the other infant graves, and this one does not fall

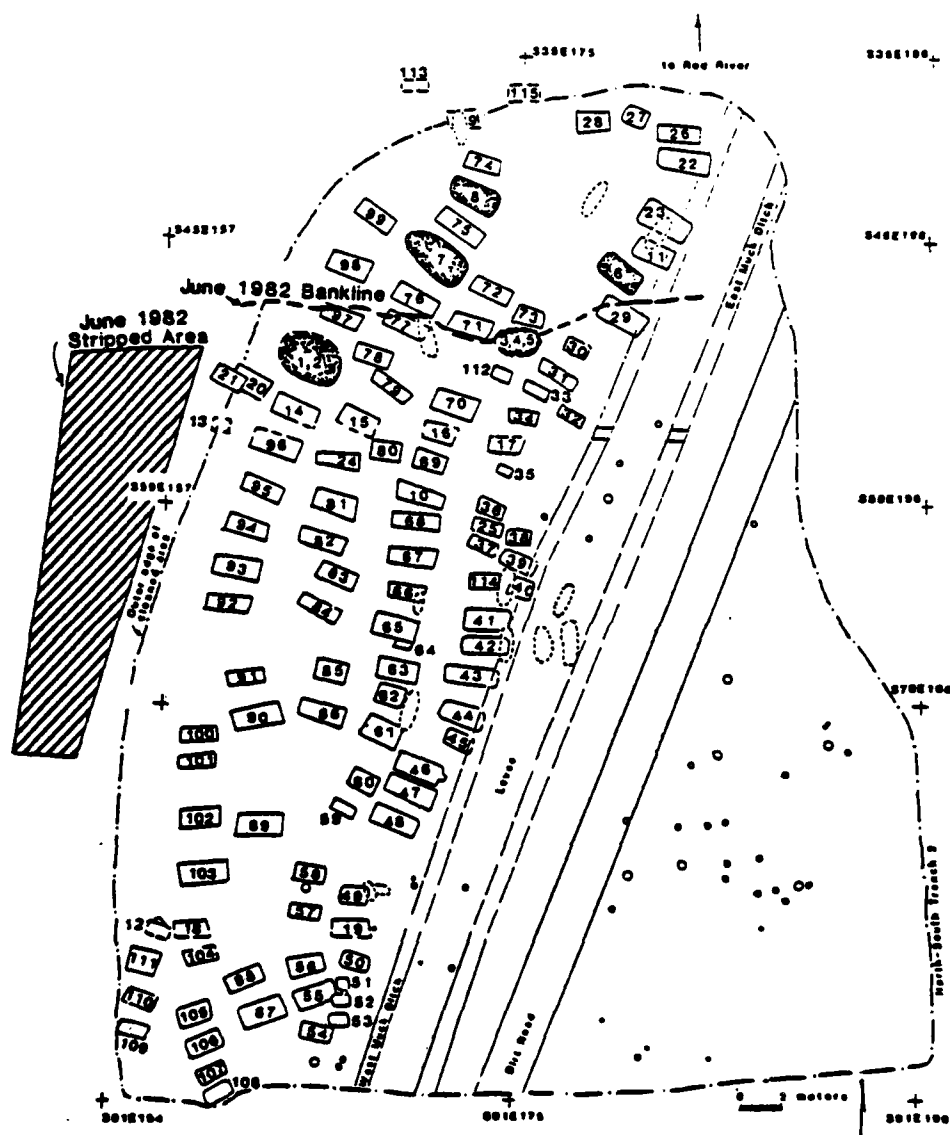


Figure 6-1. Map of Cedar Grove Cemetery during 1982 excavations.

TABLE 6-1

Cedar Grove Burials with Plaques Arranged by Plaque Type¹

Type	Burial Number
I	10, 33, 39, 66, 67, 70*, 77, 78, 81, 83, 92, 94, 95, 96
II	14, 29*, 42
III	15*
IV	41*
V	68
VI	79*
VII	93*
Unknown Type	21, 97
No Plaques	16, 17, 18, 19, 24, 25, 31, 34, 35, 36, 37, 38, 40, 43, 44, 45, 47, 48, 49, 50, 52, 54, 55, 56, 57, 58, 59, 60, 61, 65, 69, 80, 82, 84, 85, 86, 87, 88, 89, 90, 91, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 114

¹ The typology of burial plaques (as well as the other casket hardware) implied by this table is entirely artificial and provided only for convenience. Once mortuary supply catalogues are located, the plaques (as well as the other hardware) can be assigned to their emic types. The type categories here are nothing more than all plaques which are identical.

* Indicates Burial with photograph of plaque in Chapter 5.

neatly within any row. It may have been buried at a later or earlier time, although the artifacts present do not necessarily indicate this.

The primary artifacts found with infants were buttons and brass safety pins. Nineteen burials exhibited only porcelain buttons; three had both shell and porcelain buttons; two contained only shell buttons; one had a button of a synthetic material, probably plastic; and seven exhibited no buttons. Buttons were recovered in positions suggesting use of these on the upper portion of a gown or as closures down the front of a gown which extended from the neck to the feet. Consideration was given to the locations of these different types of buttons to determine if graves in various parts of the cemetery differed with regard to buttons present. Burials with only shell buttons (34 and 35) are in the north cluster. Those with both shell and porcelain buttons (52, 109, and 114) are found in both the north and south portions of the cemetery. The same is true for porcelain buttons, and those burials without buttons. The burial with the synthetic button is in the north portion of the cemetery. Therefore this artifact type does not appear to provide insight for dating the various parts of this portion of the cemetery.

Safety pins generally were found in the pelvic area and mostly consisted of two or three pins, although some burials exhibited more. These were probably used on diapers. Only four burials displayed some evidence suggesting that individuals were buried with shoes on the feet or within the casket (17, 49, 50, and 54). The locations of these burials do not appear to relate to spatial or chronological organization of the cemetery. They were found at both the north and south ends.

Children (2-13 years)

Nine burials of children between approximately 2 and 13 years were found. These include Burials 16, 19, 57, 78, 83, 88, 100, 101, and 104. There does not appear to be any distinct clustering of graves of children in specific parts of the cemetery as there is with infants. Only three of the burials (78, 83, and 104) exhibited casket handles and lid fasteners (Tables 6-2 and 6-3). Two of these (78 and 83) also contained plaques. None of the handles or fasteners were identical for any of the burials, although the plaques were identical. Nails were present with all, but lining tacks were found only with four burials (16, 57, 78, and 104). Other types of decorative tacks were found with Burials 78, 83, 100, and 101. Only one burial, 104, exhibited fragments of plate glass suggesting that a bust window may have been present. The presence of handles, lid fasteners, decorative and lining tacks does not appear to relate to the location of the burials in the cemetery. These are present with those at both the north and south ends. It should be noted that the child burials with plaques were found in the north central portion of the cemetery where all other burials with plaques were excavated. This large cluster also shows much more orderliness in placement of graves, and may reflect both a later area of burial as well as a family or closely knit community plot. South of this area graves appear to be placed more randomly.

Three types of casket shape were observed: tapered toward the feet (three caskets), rectangular (three caskets), diamond (two caskets), and

TABLE 6-2

Cedar Grove Burials with Casket Handles Arranged by Casket Handle Type¹

Type	Burial Number
I	10
II	14, 15, 29* 42, 79
III	21*, 94, 95, 96, 97
IV	24*
V	31, 77, 78*
VI	39, 41, 43, 44, 61, 65, 66, 67, 70*, 81, 83, 84, 90, 92, 93
VII	47*, 48, 89
VIII	55, 87, 104*
IX	68*
X	102*, 103
XI	104*
No Handles	16, 17, 18, 19, 25, 33, 34, 35, 36, 37, 38, 40, 45, 49, 50, 52, 54, 56, 57, 58, 59, 60, 69, 80, 82, 85, 86, 88, 91, 100, 101, 105, 106, 107, 108, 109, 110, 111, 112, 114

¹ Denotes casket handles which are identical.

* Indicates Burial with photograph of casket handle located in Chapter 5.

TABLE 6-3

Cedar Grove Burials with Lid Fasteners Arranged by Lid Fastener Type¹

Type	Burial Numbers
I	10*, 81
II	14, 29*
III	15*
IV	39, 41, 43, 44, 47, 48, 55, 61, 65, 66, 67*, 83, 86, 87, 89, 90, 95, 92, 93, 95, 96
V	24, 77*, 78, 84, 94
VI	31*, 48, 67, 94
VII	42
VIII	21, 70*, 97, 102, 103, 104
IX	79
No Fasteners	16, 17, 18, 19, 25, 33, 34, 35, 36, 37, 38, 40, 45, 49, 50, 52, 54, 56, 57, 58, 59, 60, 68, 69, 80, 82, 88, 91, 100, 101, 105, 106, 107, 108, 109, 110, 111, 112, 114

¹ Denotes lid fasteners which are identical.

* Indicates Burial with lid fastener photograph located in Chapter 5.

indeterminate shape (one casket). The locations of these caskets does not suggest that shape correlates with cemetery position. Tapered and rectangular caskets are both found at the north and south ends. Diamond ones are found at the south and central areas, but the sparsity of caskets of this shape prevents a determination that shape and location are associated factors.

Orientation of bodies is generally northwest-southeast. While Burial 16's head was placed to the east, it may have been that the casket was accidentally turned around since it lacked handles, fasteners, or other means for identifying the head end. Although one folk belief supports burial with the head to the east, there is nothing to suggest this practice was followed here.

The primary artifacts found with the burials are shell and porcelain buttons. Only one, Burial 100, lacked any evidence of buttons. It appears that, in general, the locations of buttons within the burial does not provide significant insight on the sex of the individual. Porcelain and shell buttons are found with males and females, and they were used on shirts, blouses, dresses, pants and other clothing. Consideration of the locations of burials with these types of buttons suggests, as in the case of infants, that material used does not relate to the location of the burial within the cemetery.

Burial 100 contained numerous necklace beads. Some of these are like those found with Burial 39, an adult female. It is proposed that Burial 100 is also female. Based on preliminary examination of artifacts, no additional suggestions can be presented regarding sex of individuals.

Only Burial 83 exhibited a possible egg shell fragment in the cranial region. Information was given in the descriptive section on beliefs regarding eggs. None of the artifacts present with this burial otherwise suggests a unique situation of burial.

Adolescents (13-20 years)

Only three burials were found within this age range. These are a male Burial 55, and sex indeterminate Burials 48 and 84. All burials are south of the cluster mentioned in previous discussions. All of the burials exhibit casket handles and lid fasteners, as well as nails. The handles are of different types for each of the burials, while lid fasteners all appear to be the same (Tables 6-2 and 6-3). Only Burial 48 and 55 exhibit lining tacks, suggesting the possibility of a lining, but all burials contain diamond tacks. Burial 48 also exhibits plate glass from a viewing or bust window. All of the caskets were rectangular in shape.

Primary artifacts found with the burials are porcelain and metal buttons. It is proposed that Burial 48 is a female in view of the presence of snap fasteners. These appear to be found almost consistently with females. This is also the burial with a bust window. Both Burials 55 and 84 contain eyelets and/or evidence of shoes. It is proposed that both of these individuals were males. A bullet slug was also found with Burial 55. As noted, shoes appear to be associated with individuals of most age groups,

despite folk tradition which states that an individual should not be buried with shoes.

Young Adult (20-30 years)

Six burials were found of individuals in this age group. These are: 10, 65, 77, 79, 81 and 103. Burials 10 and 77 are males; the rest appear to be females. All of the burials, except 103, are in the large cluster in the north central portion of the cemetery which demonstrates more orderliness in burial. All of the burials contained casket handles, lid fasteners, nails and diamond tacks. Casket handles appear to be different for most of the burials. Only Burials 65 and 81 exhibit identical handles. A similar situation exists for lid fasteners. Burials 10 and 81 and Burials 21 and 103 have identical fasteners respectively.

Burial 79, 81 and 103 lack lining tacks. None of the burials exhibit plate glass indicative of a viewing or bust window. Only Burials 65 and 103 lack a plaque within the casket. Burial 65 is on the south edge of the cluster described above, and Burial 103 is at the south end of the cemetery, where one of the burials displayed plaques. It does not appear that there is a distinct relationship between the absence/presence of plaques and sex of the individual. Both burials lacking plaques were females, but their locations outside of the cluster probably explains the absence of this artifact. Both males and females within the cluster have plaques. There is also no apparent relationship between the placement of the plaque on the body or casket and sex of the individual. Burials 10, 77 and 81 exhibit the plaque in the thoracic region, while Burial 79 is indeterminate. The process of casket deterioration probably affected the way in which the plaque fell. Therefore, the plaques on casket lids may have been more consistently centralized over the body. Three types of casket shape were observed: rectangular (three caskets), tapered to head (one casket), tapered to feet (one casket), and indeterminate (one casket). All burials are oriented NW-SE, consistent with folk tradition.

Primary artifacts found with burials are shell and porcelain buttons. Burials 79, 81 and 103 lacked buttons. Only Burial 10, a male, exhibited bone buttons. The shell buttons were generally more abundant, although Burial 65 also displayed metal buttons. There appears to be no relation between type of button and location in the cemetery.

Some clothing components appear to be associated with a specific sex. Studs are found with males in Burial 10 and 77. These were probably used for collars and/or cuffs. Burial 10 also contained a metal cufflink. Snap fasteners are found only with a female, Burial 81, although other female burials do not contain this type of artifact. Safety pins are sparse, but reflect no consistent relationship with persons of either sex although more female burials had safety pins present. The pins were often found at the foot end of the casket, indicative of some unidentified use.

Shoe parts are found with Burials 81 and 103, both females. As noted, shoe parts are also found with infants and adolescent males.

Jewelry is sparse and found exclusively with females except for the cufflink with Burial 10. A silver ring is found with Burial 65, while loop earrings for pierced ears are found with Burials 81 and 103.

Hard rubber or early plastic combs are found with Burials 65 and 81, both females. These were recovered by the crania and were probably used as decorative haircombs. Burial 10, a male, contained a patent medicine bottle, held in the left hand or placed in a pocket.

Middle Ages Adult (30-50 years)

A total of 24 burials were found within this age group: 14, 15, 24, 29, 31, 39, 41, 42, 43, 47, 61, 66, 67, 68, 82, 86, 87, 89, 90, 92, 93, 94, 95, and 96. Burials 15, 24, 39, 41, 42, 66, 67, 68, 82, 92-96 appear in the orderly cluster in the north central portion of the cemetery. There are eight different types of casket handles found with these burials (see Table 6-2). Burials 82, 86, and 96 did not have casket handles. Burials 24 and 42 also exhibited plain handles that were apparently associated with an outside box or vault (see Table 6-4). Although numerous burials with the same handle are found within or close to the orderly section of the cemetery, it does not appear that location of the burial and handle type correlate. At the same time, different types of handles are also found in this section. Seven distinct types were identified for this age group (see Table 6-3). As in the case of casket handles, most of the fasteners (65%) are of Type I, but their spatial distribution does not suggest distinct clustering at this level of analysis. Most of them are within the cluster in the north central part of the cemetery, but this is also where most of the burials are located. Eleven of the burials also exhibited a less ornate thumbscrew possibly associated with the lid of an outside box (see Table 6-4). Fourteen of the burials within this age group exhibit plaques with the words "At Rest." There are six different plaque types observed, with 50% from Type I (see Table 6-1). It does not appear that plaque type necessarily relates to the sex of the individual. Burials 15 and 68 are males and exhibit distinct types (i.e., III and IV), while Burials 14, 29, and 42 are females and exhibit plaque type II. But the majority of burials exhibit one plaque type (i.e., I) that is associated with both males and females. Burials 92 and 96 are males, while the rest of the individuals in that group are females. The disproportionate number of plaques with females is actually due to the greater number of females within this age group. Unlike the other casket components, the location of the grave within the cemetery does appear to be a critical factor in determining whether a plaque is present or not. All burials with plaques are found within the orderly cluster in the north central portion of the cemetery.

All of the graves appear to be oriented in a northwest or west to southeast direction. There are three distinct casket shapes: tapered to feet (eight caskets), rectangular (ten caskets), tapered to head (two caskets), and diamond (two caskets). Shapes of two caskets could not be determined. Glass fragments with burials 39, 67, 94, 95, and 96 suggest that viewing or bust windows were present with these caskets. All of these burials, except Burial 96, are females. Considering the sparsity of males in the age group, it cannot be proposed that presence of windows correlates with sex. In fact, the presence of a window with one male tends to discount such

TABLE 6-4

Cedar Grove Burials with Proposed Outside Boxes Arranged by Lid Fastener Type¹

Type	Burial Number
I	15, 24, 29
II	21
III	39, 41, 48, 66, 67*, 81, 84, 92, 102
IV	43
V	70, 77, 78, 96
VI	95
VII	104
No Fasteners	10, 14, 16, 17, 18, 19, 25, 31, 33, 34, 35, 36, 37, 38, 40, 42, 44, 45, 47, 49, 50, 52, 54, 55, 56, 57, 58, 59, 60, 61, 65, 68, 69, 79, 80, 82, 83, 85, 86, 87, 88, 89, 90, 91, 93, 94, 100, 101, 103, 105, 106, 107, 108, 109, 110, 111, 112, 114

¹ Indicates burials with identical lid fasteners.

* Indicates Burial with lid fastener photograph in Chapter 5.

an interpretation. All of the burials with bust windows are within the north central cluster described previously.

Shell buttons are the primary artifacts buried with the individuals, although bone, porcelain, glass and metal ones are also present. Types of buttons do not appear to relate to location of the burial in the cemetery. A number of the burials also exhibit various items of jewelry, including finger rings, cufflinks, studs, combs, earrings, beads, coins, buckles, and so forth. Items found with males include: cufflinks, studs, suspender buckles, and bone buttons. Objects with females include: glass buttons, rings, combs, snaps, earrings, coins, and beads. Evidence of shoes was found with Burial 47, a female, and Burial 92, a male. This indicates that shoes could be found with either sex.

Egg shell was found by the cranium of Burial 68, a male, and Burial 14, a female. Egg shell was also found with Burial 83, a child, and with Burial 21, among the old adults. It cannot be determined if the presence of egg shell relates to folk traditions cited earlier.

It can be stated that, in general, individuals of the middle age group display more diversity than the other ages in the artifacts buried with them, as well as quantitatively more items. In addition, it appears that females exhibit more artifacts, particularly jewelry, within caskets. Artifacts interred with men consist primarily of buttons, studs, cufflinks and other items associated with clothing.

Older Adult (50+ years)

Five burials were found of individuals older than 50 years. These include three females, Burials 21, 70, and 102, and two males, Burials 44 and 97. The burials include casket handles, lid fasteners, nails, and other materials present with most other burials exclusive of infants. These burials are scattered throughout the cemetery with no apparent pattern. All but Burial 44 have the same (Type VIII) lid fasteners. There is another fastener type present with Burials 21, 70, and 102 which suggests the presence of an outside box or vault. Only Burial 70 exhibits evidence of a bust window. Three of the burials contain the remains of a metal plaque. Burial 70 could be identified as Type I, while the plaque remains for Burials 21 and 97 were too fragmentary to identify. Casket shapes do differ with Burial 97 diamond shaped, Burials 21, 70, and 102 rectangular, and Burial 44 tapered toward the feet. Other artifacts are diamond and lining tacks, suggesting that the caskets were probably lined.

Artifacts not associated with the casket were variable, but consisted primarily of buttons. Three shell buttons were found in the pelvic region of Burial 97 and may have been associated with trousers. One porcelain button was found in the thoracic region of Burial 102 which may have been associated with a dress. Burial 21 produced snap fasteners probably associated with a dress and the remains of egg shell. The implications of egg shell have been previously discussed. A ceramic plate with decalcomania was found with a female, Burial 70.

SUMMARY

In summary, there are at least three basic patterns which emerge from this preliminary mortuary analysis. There are two clusters of infant graves: one along the northeast border adjacent to the levee; and the other in the southwest corner. These two clusters could represent designated infant burial locations, but the random location of other infant graves argues against this notion. Another interesting cluster is the north central area of orderly arranged graves, most of which also contained plaques. This pattern could represent a family grouping or a temporal event such as a change in mortician. Unfortunately the other casket hardware does not yield a similar pattern. The distribution of artifacts by age does produce a simple status hierarchy. With one exception, infants have no casket hardware or personal goods which suggests a low status. This phenomenon is often found in cultures where infant mortality is high and little emotional investment is made until they reach survival age. The presence of casket hardware and personal goods is rare and highly variable with the children, and suggests that the presence of these items may have been associated with the relative wealth of their parents. Adolescents and young adults tend to receive full mortuary treatment with handles, fasteners, plaques, and even bust windows. This treatment seems to reflect their status as full adults. The middle-aged adults usually received full mortuary treatment, but also contained the largest frequencies of personal goods such as jewelry (i.e., combs, beads, rings, studs, etc.). These personal items do not necessarily represent wealth and status, but reflect the accumulation of the trappings of adulthood by virtue of the length of time which they had participated in that role. The older adults received full mortuary treatment, but tended to have fewer personal goods and may reflect their passage out of the full adult roles. In other words, they no longer feel the necessity for these possessions and pass them on to their children and grandchildren.

The above interpretations were made within the framework of traditional archeological mortuary analysis, but the availability of ethnographic information calls this into question. As was described in Chapter 2, the Cedar Grove residents belonged to a burial society called the Circle of Friends to which dues were paid. The absence or rarity of casket hardware may simply have been dictated by society rules, lower dues for children, or the requirement of a certain length of membership in the society. This interpretive problem must await further oral and documentary history data.

The presence of dental work on the teeth of some adults does indicate the accumulation of some surplus funds as Black American access to a dentist in this particular time and place appears to have been an expensive and difficult task (Angelou 1970:158-164). The fact that some economic differences did occur is also supported by the fact that at least one family buried in the Cedar Grove Cemetery owned their own farm (see Chapter 2). The above statements must be considered preliminary until a computerized analysis of the merged biological and artifactual data is performed. These data do offer an excellent opportunity to test some of the assumptions of archeological mortuary analysis against a known cultural pattern which could be derived from documents and oral history of the Cedar Grove community.

CEDAR GROVE DEMOGRAPHY

Before any of the biological or cultural data obtained from the excavated graves can be generalized to the entire community the degree to which the demography of the excavated graves resembles a natural biological population must be determined. Furthermore demographic analysis is the ideal method for evaluating the stress level and adaptive success for any given population. Modern and historic populations can be studied using a number of data sources which include church records, county and state birth and death records, the manuscript census, as well as tombstone inscriptions. The prehistorian, however, does not have access to these data sources and must rely upon skeletal data obtained from the excavation of cemeteries. Despite extensive criticism of using skeletal data for demographic analysis (Howell 1973; Weiss 1973; among many others), it has been demonstrated that paleodemography can be a very productive technique (Lallo et al. 1980; Lovejoy et al. 1977; Moore et al. 1975; Weiss 1973). Cedar Grove is somewhat unique in that both documentary and skeletal data are available for analysis. With additional documentary work the Cedar Grove sample could be used to test many of the assumptions of paleodemography. The availability of skeletal data from a rural Black community at the turn of the century may be particularly valuable. Demographers consider the Black documentary demographic data for the slavery period and after 1930 to be adequate, but the period in between is considered to be particularly inadequate (Farley 1970). Even the manuscript censuses for 1870, 1890, and 1920 are considered suspect for rural Blacks (Farley 1970).

The first requirement for establishing the demographic value of a skeletal sample is the quality of the cemetery excavation. Trubowitz (Chapter 3) using the 1980 grave outlines (Figure 6-1) estimates that there were between 111 and 113 graves within the direct impact zone. The inexact count derives from the fact that at least two graves (Burials 3 and 30; Burials 4 and 73) could have been numbered twice during the gradual labeling of graves during the 1980 excavations. This was complicated by the 1980 relocation of graves 1-5. Although these grave outlines were destroyed, it is not known how many skeletons were removed. Four additional graves were relocated, but the presence of tombstones enables them to be counted: Burial 6 (Minnie Wilkerson), Burial 7 (J. D. Richards), Burial 8 (Lue Powell), and Burial 9 (Mary Mitchell). Using both the 1980 and 1982 excavation data suggests that nine graves were either relocated or destroyed. The grave containing Burial 12 had been destroyed by heavy earth moving equipment in 1980. An additional 16 graves were destroyed by the Red River between the two excavation seasons: Burials 11, 22, 23, 26, 27, 28, 71, 72, 74, 75, 76, 91, 98, 99, 113, and 115. An additional nine labeled graveshafts were empty: Graves 13, 20, 32, 46, 51, 53, 62, 63, and 64. There are three explanations for these empty shafts. First, at least one shaft was dug by the grave diggers who backfilled it after encountering another casket. Second, several were stains from unknown features which were identified on the scraped surface but were not grave shafts upon excavation. Third, one or more could have been shallow infant graves destroyed during the first earth moving operation, although this is considered to be unlikely. A total of 78 graves produced skeletal material upon excavation. These categories total to the predicted 112 graves which means that 73.6% of the people interred within the direct impact zone were recovered.

Since only a portion of the Cedar Grove cemetery was excavated it must be determined if the excavated portion is representative of the total. Using the density of graves in the direct impact zone and the 1925 map of the local showing the cemetery, Trubowitz (Chapter 3) estimates that the entire cemetery contains 279 graves. This figure should be reduced by 7% (260 graves) in order to compensate for the empty graves within the direct impact zone. Both Watkins (Chapter 2) and Trubowitz (Chapter 3) use the estimated number of graves and documented mortality rates to suggest that the cemetery was first used with the founding of the Barnett Plantation in 1834. The twentieth century dates on the northern tombstones (i.e., Burial 6, 1915; Burial 7, 1917; Burial 8, 1919; Burial 9, 1925) suggested to these researchers that cemetery usage began in the southern portion and progressed chronologically toward the northern portion of the cemetery. The estimated burial dates from the excavated northern portion all indicate post-1890 burials and corroborate this inference. Based on these data and assumptions, the excavated graves represent 40% of the total graves postulated for the entire cemetery. Since the earliest date for the excavated graves is 1890, the excavated portion of the cemetery spans 37 years. The period from 1890 to 1927 represents 40% of the total estimated time of cemetery usage (i.e., 40% of 1834-1927). Thus the proportion of excavated graves to total cemetery population is the same as the proportion of time represented by the excavated graves to total time of cemetery usage. Although this reasoning is somewhat circular it is corroborated by the 1890 date of earliest direct impact zone burial. In other words, the 1890 date established from the artifactual material produces the same mortality rate (i.e., 2.8 per year) as employed by Trubowitz. Thus the evidence suggests that the excavated skeletons represent a chronological slice (i.e., 1890-1927) of the entire Cedar Grove mortuary content.

The second requirement for establishing demographic value is determining what portion of the living community is represented by the cemetery sample. There are three additional cemeteries used by the Cedar Grove community. The Wright Cemetery is located at the north end of Battle Lake approximately 4 km north of the Cedar Grove Church. The two Mays cemeteries are located on Mays Lake less than 2 km east of the Cedar Grove Church. The Cedar Grove Cemetery itself is approximately 4 km west of the church. The three additional cemeteries resemble Cedar Grove in that there are many unmarked graves and a few late tombstones (Figures 3-3 and 3-4). No historical research has yet been done on these three cemeteries. It is quite likely that the Wright cemetery had its beginning as a plantation cemetery for slaves and that after emancipation the Blacks continued to bury their dead in the cemetery used by their kin groups. There is a strong cultural tradition for interring kin groups together. Thus, it is likely that the Cedar Grove sample represents the descendants of the Armor and Sentell freedmen. Unfortunately the church records were destroyed by fire, but additional oral history should clarify the relationship of the four cemeteries to the Cedar Grove Church and community. For example, Kleinhans of the New Orleans District Office of the Corps of Engineers obtained information that there was once a church located across from the Wright Cemetery. Its relationship to the Cedar Grove Church is currently unclear (personal communication). For purposes of this analysis the Cedar Grove Cemetery is assumed to represent the dead of the local population and since the cemetery was not yet full at the time of the flood (see Figure 3-1), there would have been no reason for these people to use the other cemeteries until after the flood.

The final criteria for demographic reliability is that the cemetery sample must resemble a normal biological population. The first item to be considered is the male/female ratio (Table 6-5). The sex ratio for the Cedar Grove sample is 0.71 and even adding the three males and one female relocated in 1980 only raises the ratio to 0.82 which is well below the expected ratio of 1.0. There are three possible explanations for this surplus of females.

First, several of the skeletons could have been incorrectly sexed. In fact, there are four possible females (Burials 70, 79, 93, and 102) which exhibited mixed sex indicators and the final decision to classify them as females could have been in error. Although future analysis using seriation and multivariate analysis may reverse these sex designations, it does not appear likely at the present time.

The second explanation involves random variation in a small sample. For example, tombstone data (Table 6-6) from six small rural northwest Arkansas family plots contemporaneous with Cedar Grove show that a surplus of females is found in three of the plots and their sex ratios are similar to Cedar Grove (i.e., 0.6 - 0.8). One factor in this surplus of females is that several of the males had more than one wife having outlived the first. Using the list of known individuals buried at Cedar Grove collected by Watkins (Chapter 2), it was found that three (17.6%) of the men had two wives. If each of the wives was buried in Cedar Grove and removed from the calculations the sex ratio would be 0.9.

The third explanation considers the possibility of a shortage of males due to cultural factors. The period from 1880 to 1920 was a period of both social and economic upheaval for rural southern Blacks. For example, Gutman (1976:432-460) states that starting in 1880 the number of male absent Black households had increased sufficiently to be noticed demographically. The major motivating force behind this family pattern was economic stress which encouraged males to abandon their families or relocate in search of work. There is considerable evidence for economic stress among rural Arkansas Black farmers between 1880 and 1905 associated with a fall in cotton prices and the appearance of the boll weevil in Arkansas (Graves 1967:30-33; Sylva 1981:52). This stress contributed to considerable outmigration of Blacks, especially males, from Lafayette County (Sylva 1981:16, 32). It would only take one or two males leaving the Cedar Grove community to explain the observed sex ratio.

There is no way to choose which of these explanations affected the Cedar Grove sex ratio and in fact each of them probably contributed. When the small adult sample size is considered the Cedar Grove sex ratio is not statistically different from normal (χ^2) and resembles a normal population.

The most unusual demographic feature of the Cedar Grove sample is the large proportion (55.0%) of individuals younger than 15 years, which is very unusual for a skeletal sample. This proportion of subadults is identical to that (55.3%) produced by model life table 15.0 - 45.0 (Weiss 1973:118) which represents a highly stressed population. The computed life expectancy at birth for Cedar Grove is 14 years and is only slightly below the 15 years predicted by life table 15.0 - 45.0 (Weiss 1973:118). The only unusual difference between Cedar Grove and this model table is the much higher

proportion of individuals less than one year of age at Cedar Grove (27.5%) than predicted (5.4%). However, when the large number of neonatal deaths (20.0%) are removed, the resulting figure (7.5%) is comparable. Thus the subadult portion of the Cedar Grove skeletal sample resembles a normal although highly stressed population.

The age distribution of the Cedar Grove skeletons must also be examined for normality. For convenience of visual comparison the Cedar Grove age distribution has been cast into probability of dying statistics using standard life table procedures (Weiss 1973). The small sample size severely reduces the reliability of these statistics and they have only comparative value (Figure 6-1). Four comparative samples have been chosen to represent the broad range of mortality data sources: (1) model life table 15.0-45.0 (Weiss 1973:118); (2) skeletal data, Mobridge 2 Arikara Cemetery (Palkovich 1981:75); (3) manuscript death records, Carib Indians (Rose and Owen, 1976); and (4) tombstone inscriptions, Elm Springs Cemetery (Washington County Historical Society, n.d.). The Mobridge 2 cemetery sample of protohistoric Arikara was chosen because it is a well preserved and well aged skeletal sample from a highly stressed population (Palkovich 1981). The Carib Indian data from the Caribbean Island of Dominica were chosen because of availability and the fact that they represent a small isolated group (Black - Carib Indian mixed ancestry) of subsistence farmers from a time period roughly comparable to Cedar Grove (Rose and Owen 1976). Elm Springs is a rural white community cemetery from northwest Arkansas which was chosen because of availability and comparable time period to Cedar Grove (Washington County Historical Society, n.d.). All probability of dying curves except the model life table are truncated at 50 years of age to reflect the limit of the skeletal age determination techniques.

Up to 10 years of age the Cedar Grove sample closely matches the model life table and Mobridge 2, while the Caribs have slightly lower probabilities after the first year. As previously noted the subadults resemble a normal population and this comparison emphasizes their similarity to highly stressed groups. The Elm Springs curve representing a robust population is well below the others.

Cedar Grove diverges from the others with a drop in adolescent mortality (i.e., 15-20 years) and a rapid rise in adult mortality which even exceeds the highly stressed Mobridge 2 sample. This abnormality raises the questions of whether the Cedar Grove adult sample is reliably aged and representative of a normal population. Systematic underestimation of age was considered, but checks of the field data collected with the photographs of the pubes and auricular surfaces revealed no errors. One problem which did emerge is that 27.8% of the adult sample were assigned to 10 year age intervals instead of five year intervals. Of these 50% are females between 30 and 40 years of age indicating a systematic problem with this group. Future research using a multifactorial approach and additional age methodologies (i.e., bone and dental histology; dental attrition) should resolve this problem. However, this lack of precision does not explain the very young ages at death with 52% of the females dying between 30 and 40 years and 47% of the males between 40 and 50 years.

The only sampling problem which would explain this phenomenon is that a significant number of old adults are missing from the sample. Of the 16

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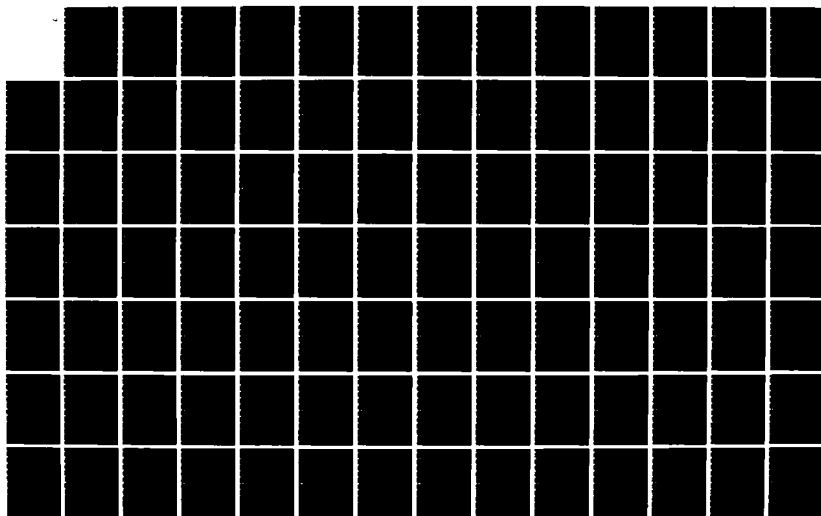
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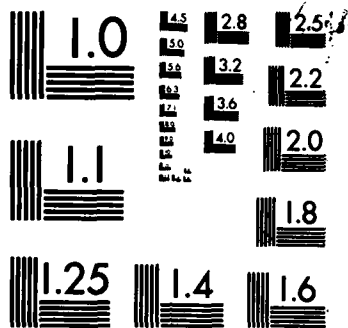
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE 6-5

Demography Cedar Grove Historic Cemetery

Age	Unknown Sex	Males	Females	Total
Birth	16			16
.3-.9	6			6
1-1.9	11			11
2-4.9	1			1
5-9.9	5			5
10-14.9	5			5
15-19.9		1	0	1
20-29.9		2	4	6
30-39.9		3	11	14
40-49.9		7	3	10
50+		2	3	5
Total	44	15	21	80

TABLE 6-6

Rural Arkansas Family Cemeteries Utilized Between 1790 and 1930

Cemetery	Number of Graves	Male/Female Ratio
Baker	8	0.6
Beaty	6	5.0
Boone	9	0.8
Boyd	4	1.0
Brewster	14	0.8
Deen	8	0.6

Cemetery Records of Washington County, Arkansas
 Vol. 1 Academy - Evergreen Cemeteries
 Washington County Historical Society Fayetteville, N.D.

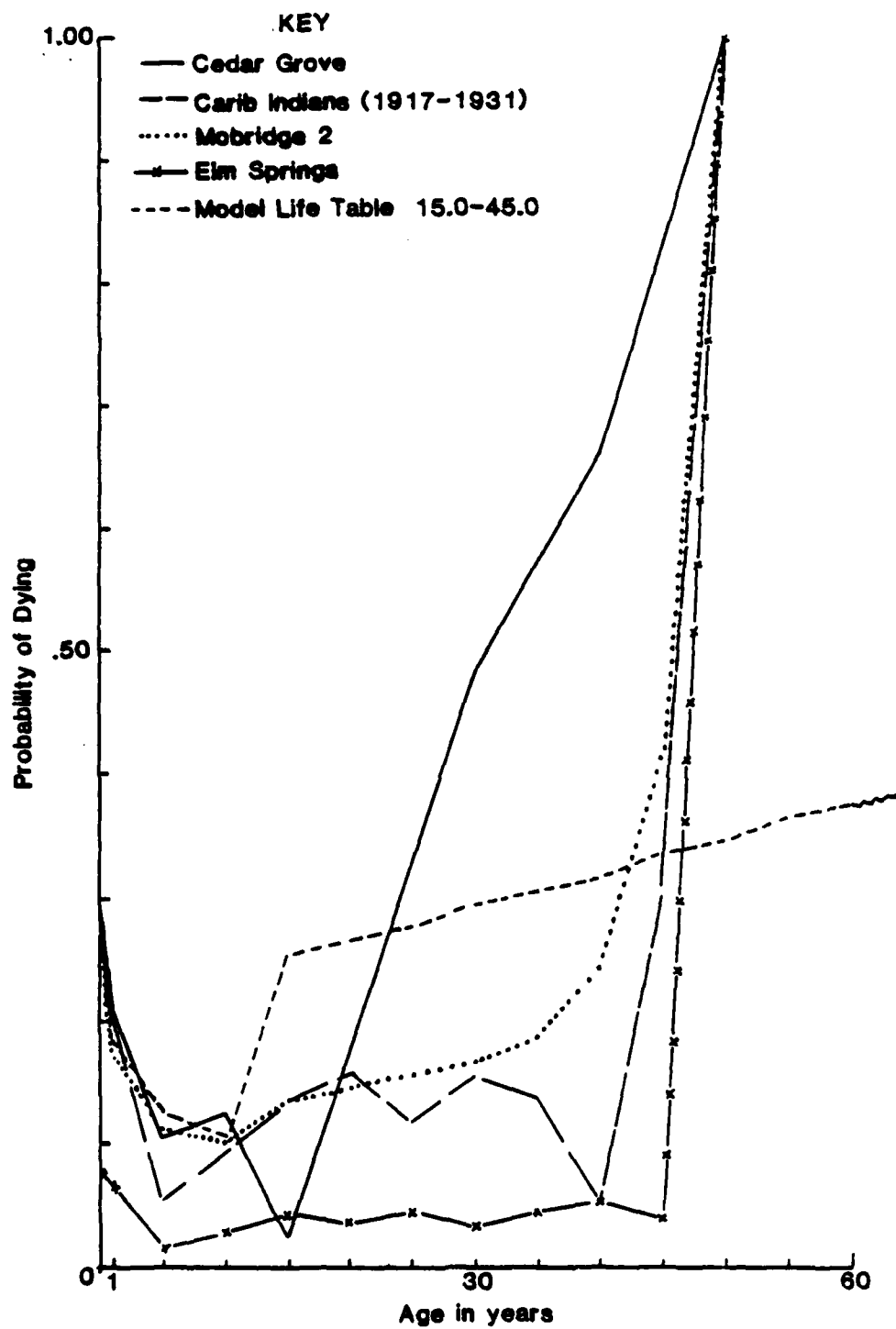


Figure 6-2 Probability of dying for Cedar Grove and four comparative samples.

graves destroyed by the Red River at least 60% should have been adults judging by the graveshaft outlines. Additionally, four of the five relocated graves with tombstones are adults over 50 years of age. This again raises the question of age at death and mortuary benefits of membership in the burial society. However, Minnie Wilkerson was a subadult and had a Royal Circle of Friends tombstone which tends to refute this hypothesis. Support for this hypothesis is supplied by the age distribution of tombstones in the Black Sandy Ground Cemetery on Staten Island (Schuyler 1972). Of the 51 recorded stones 66.7% are for people over 50 years of age, while only 5.9% are for children younger than 10 years producing an age correlation with tombstone frequency. This contention requires additional research on the Royal Circle of Friends Society. Adding the four relocated adults to the five recovered skeletons brings the proportion of adults over 50 years of age to 11.2% of the total sample, which is well above the 2.6% required by model life table 15.0-45.0 (Weiss 1973:118). The fact that the proportions of adults and old adults are compatible with the model life table suggests that the Cedar Grove sample does resemble a normal population. The high probability of dying statistics for the 30-40 year group is due to the large number of females (52%) dying during this age interval, which may not be due to sampling but represent the action of stress and disease. For example, the 1918 influenza epidemic which killed large numbers of young adults significantly raised the Black American mortality rate (i.e., from 23/1000 in 1917 to 28/1000 in 1918) and could have contributed to this hump in the mortality profile (Farley 1970:71).

In conclusion, these comparisons indicate that the Cedar Grove skeletal sample does resemble a normal population that in all probability represents the dead of the Cedar Grove community between 1890 and 1927. Although some of the problems raised by this discussion will be resolved by future historical research, for the purposes of this study the sample can and will be considered representative. It should be pointed out that this sample is not longitudinal but cross sectional. In other words it represents the deaths occurring between 1890 and 1927. Thus the child skeletons will reflect the conditions of life during this time period, while the adults will reflect this as well as earlier periods. In fact several of the adults interred at Cedar Grove and possibly represented in the excavated sample would have begun life as slaves (see Chapter 2).

CEDAR GROVE PALEOPATHOLOGY

The Cedar Grove skeletal series is most remarkable for the extremely high rate of skeletal lesions, almost 90% of the entire sample exhibit at least one. The diagnosis of specific diseases from skeletal remains is extremely difficult because very few pathological lesions are specific for a single disease (Ortner and Putschar 1981; Steinbock 1976). The identification of specific diseases requires the use of differential diagnosis which employs both the patterning of skeletal lesions within the individual skeleton and across the demographic profile of the entire sample (Buikstra 1976b; Steinbock 1976; Palkovich 1981). The most successful approach uses diagnostic keys of skeletal lesions constructed from the modern diagnostic and epidemiological literature (Buikstra 1976b). Unfortunately few paleopathologists have worked in the modern period and thus the only available modern disease key is for tuberculosis (Buikstra 1976b).

TABLE 6-7

SUBADULT PATHOLOGY ARRANGED BY AGE FOR CEDAR GROVE HISTORIC CEMETERY

Burial #	AGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
25A	7mu							1								
25B	7mu							1								
35	7mu	1						1								
49	8mu							1	1			1				
109	7mu	1						1	1			1				
36	0ms							1				1				
37	0ms	1						1								
45	0ms							1								
52	0ms										1					
58	0ms	1						1								
80	0ms							1								
91	0ms							1								1
106	0ms	1						1	1			1				
107	0ms	1						1	1			1				
110	0ms							1	1							1
38	0ms															

TABLE 6-7 (Cont.)

Burial #	AGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
112	3ms									1				1		
60	6ms	1		1				1								
105	6ms	1						1	1			1				
50	9ms									1						
85	9ms	1	1					1								
18	10ms															
17	13ms											1				
34	13ms	1				1							1			
33	15ms					1	1									
54	18ms	1														1
56	18ms								1							
59	18ms	1						1	1							
69	18ms	1				1		1	1							
108	18ms	1						1	1							
111	18ms							1	1							
114	18ms	1				1						1				
40	20ms	1														1
16	3.5ys							1								

TABLE 6-7 (Cont.)

Burial #	AGE	P A T H O L O G Y C A T E G O R I E S														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
78	6ys															
88	6ys		1													
57	7ys												1	1		
19	8ys															
104	8ys														1	
83	10ys															
100	10ys															
101	10ys															1
84	13ys															
48	14ys		1		1			1	1							
Total	44	16	3	1	1	4	1	23	12	2	1	11	2	2	2	1
Percent		36.4	6.8	2.3	2.3	9.1	2.3	52.3	27.3	4.5	2.3	25.0	4.5	4.5	4.5	2.3

KEY:

1. Active cribra orbitalia
2. Healed cribra orbitalia
3. Active porotic hyperostosis
4. Healed porotic hyperostosis
5. Craniotabes
6. Cupped costal rib margins
7. Systemic active periostitis

8. Endocranial active periostitis
9. Isolated active cranial periostitis
10. Endocranial healed periostitis
11. Rib active periostitis
12. Lower limbs active periostitis
13. Upper limbs active periostitis
14. Long bone healed periostitis
15. Vertebral healed periostitis

mu = months in utero

ms = months

ys = years

TABLE 6-8
ADULT PATHOLOGY FOR MALES FROM CEDAR GROVE HISTORIC CEMETERY

Burial #	AGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
10	25-30			1						1							1								
15	35-39	1					1		1				1												
24	35-40	1	1					1								1									
44	50+							1					1												
55	17							1												1					
61	40-50								1		1		1	1											1
68	40-50									1	1			1			1							1	
77	25-30				1										1										
82	45-50								1					1				1							
87	46-50							1						1	1	1	1								
89	35-39		1	1	1																				
90	45-50							1		1				1					1	1					
92	40-45							1																	
96	46-50									1	1	1	1	1					1		1				
97	50+								1					1	1	1					1	1			
Total	15	2	5	2	2		1	1	9	2	5	2	4	7	5	1	2	1	3	3	1	2	1	1	1
Percent		13.3	33.3	13.3	13.3	0.0	6.7	6.7	60.0	13.3	33.3	13.3	26.7	46.7	33.3	6.7	13.3	6.7	20.0	20.0	6.7	13.3	6.7	6.7	6.7

KEY:

1. Healed cribriform orbitalia
2. Remodeled cranial pitting
3. Ribs active infection
4. Systemic active infection
5. Upper limbs active infection
6. Upper limbs healed infection
7. Lower limbs active infection
8. Lower limbs healed infection
9. Lower limbs isolated healed infection
10. Osteoarthritis major joints
11. Osteoarthritis hands
12. Osteoarthritis feet

13. Osteophytosis
14. Schmorl's nodes
15. Hands dislocation
16. Ribs healed fracture
17. Upper limbs healed fracture
18. Lower limbs healed fracture
19. Cranium healed fracture
20. Hands healed fracture
21. Feet healed fracture
22. Bullet wound
23. Amputation
24. Osteoma

TABLE 6-9

ADULT PATHOLOGY FOR FEMALES FROM CEDAR GROVE HISTORIC CEMETERY

Burial #	AGE	PATHOLOGY CATEGORIES																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
14	30-35		1															1							
21	55+								1		1	1	1	1											
29	30-39								1																
31	30-34					1																			
39	35-39																1				1				
41	40-50		1						1		1														1
42	30-39													1											
43	46-50								1			1	1	1	1				1						1
47	30-39		1				1		1																
65	25-30		1							1															
66	35-40										1	1	1												
67	40-45		1							1	1			1									1		
70	50+								1		1			1	1										1
79	25+																								
81	20-25								1		1														
86	35-39																								
93	35-40																								1
94	30-39								1																
95	30-39		1																						
102	50+								1			1	1	1											
103	20-29					1			1									1							
Total	21	0	5	2	0	2	1	0	11	2	6	4	4	7	4	0	2	1	0	0	1	1	1	0	3
Percent		0.0	23.8	9.5	0.0	9.5	4.8	0.0	52.4	9.5	28.6	19.0	19.0	33.3	19.0	0.0	9.5	4.8	0.0	0.0	4.8	4.8	0.0	0.0	14.3

KEY:

1. Healed cribra orbitalis
2. Remodeled cranial pitting
3. Ribs active infection
4. Systemic active infection
5. Upper limbs active infection
6. Upper limbs healed infection
7. Lower limbs active infection
8. Lower limbs healed infection
9. Lower limbs isolated healed infection
10. Osteoarthritis major joints
11. Osteoarthritis hands
12. Osteoarthritis feet

13. Osteophytosis
14. Schmorl's nodes
15. Hands dislocation
16. Ribs healed fracture
17. Upper limbs healed fracture
18. Lower limbs healed fracture
19. Cranium healed fracture
20. Hands healed fracture
21. Feet healed fracture
22. Bullet wound
23. Amputation
24. Osteoma

TABLE 6-10

Causes of Subadult Deaths Among the Carib Indians of Dominica 1917-1931¹

AGE	Total	1	2	3	4	5	6	7	8	9	10	11
0.0-0.5	63	34.9	11.5	1.6	6.3	15.9	11.1	12.7				
0.5-1.0	6					33.3	33.3	16.7			16.7	
1 - 2	5				60.0	20.0						20.0
2 - 3	4				75.0	25.0						
3 - 4	8				25.0	37.5	37.5					
4 - 5	6					50.0		16.7	16.7			16.7
6 - 10	5					20.0		40.0		20.0	20.0	
11 - 15	8				25.0	12.5			37.5	12.5	12.5	
Total	105	21.0	10.5	1.0	13.3	21.0	11.4	11.4	3.8	2.0	2.8	2.0

Key:

1. Stillborn
2. Tetanus
3. Malnutrition
4. Bowel Complaint
5. Worms
6. Fever
7. Infection
8. Pleurisy
9. Heart Pain
10. Trauma
11. Unknown

¹ Rose and Owen 1976

Consequently detailed analysis of the Cedar Grove skeletal pathology will have to await future development of diagnostic keys and computer analysis of the coded Cedar Grove skeletal lesions. A preliminary analysis and interpretation of the paleopathology is presented here with detailed data in Tables 6-7, 6-8, and 6-9.

The ideal method for interpreting the Cedar Grove paleopathology would be to use death certificate data obtained from the same time period and locale. Future research will concentrate on obtaining this documentary data, but for the present analysis the cause of death manuscript data for the Carib Indians of Dominica from 1917-1930 will be used (Table 6-10). These data were chosen because of availability and the fact that they are from a time period similar to Cedar Grove (Rose and Owen 1976).

For the convenience of the reader the subadult morbidity data (Table 6-7) have been arranged by age at death rather than numerical order. All five of the infants aged to younger than birth were probably stillborn. A total of 34.9% of the Carib neonatal deaths were stillborn which is comparable to the percentage (31.2%) of prebirth aged skeletons at Cedar Grove. This suggests a similarity of stillbirths between the two samples. All five of these skeletons exhibit active systemic periostitis indicating uterine infections which could be implicated in the premature births.

Of the eleven neonates nine (81.8%) exhibit systemic active periostitis with additional lesions as follows: four (36.4%) with active cribra orbitalia, three (27.3%) with active endocranial periostitis, and five (45.4%) with periostitis of the ribs. One neonate has no lesions, while a second shows healed endocranial periostitis. Examination of the Carib data (Table 6-10) suggests five important causes of death (tetanus 11.5%, diarrhea 6.3%, worms 15.9%, fever 11.1%, and infection 12.7%) all of which can be implicated as important causes of death at Cedar Grove. Unfortunately, tetanus, diarrhea, and worms as well as the common childhood diseases of smallpox and rubella do not produce bony lesions (Ortner and Putschar 1981:227-229). Although these diseases were probably also important at Cedar Grove as the ultimate causes of death, the widespread periostitis indicates an underlying bacterial infection. The presence of the same lesions on the premature skeletons suggests that the infections were congenitally acquired.

One possibility is malaria which accounts for many of the Carib fevers and stillbirths, and was found in southern Arkansas. The effects of maternal malaria on the developing fetal skeleton needs to be determined. Another alternative is congenital syphilis which is suggested by the occurrence of possible Hutchinson's incisors on an older Cedar Grove child. Although the classic lesion of osteochondritis could not be observed, the widespread symmetrical subperiosteal deposition described for congenital syphilis is present on these neonates (Ortner and Putschar 1981:199). Other bacterial organisms or pathologies cannot be ruled out. A similar neonatal pattern of cribra orbitalia, systemic periostitis, and endocranial lesions was also observed in the highly stressed protohistoric Arikara skeletal series from the Moberg 2 cemetery (Palkovich 1981:81), although the frequency of lesions is more than ten times higher at Cedar Grove. Further work on differential diagnosis of these lesions is essential to understanding the Cedar Grove neonatal morbidity and mortality patterns.

The seventeen children between three and twenty months of age display a lesion pattern comprised of 23.5% craniotrabes, 58.5% active cribra orbitalia, 41.2% active systemic periostitis, and 35.3% active endocranial periostitis. Craniotrabes suggests vitamin D deficient rickets, while some of the periosteal deposition may be due to vitamin C deficient scurvy (Ortner and Putschar 1981:270-280). Active cribra orbitalia suggests dietary iron deficient anemia, although the occasional appearance of sickle cell anemia cannot be ruled out (Ortner and Putschar 1981:255-262; Steinbock 1976:239-248). These lesions indicate widespread dietary deficiencies associated with a corn diet, absence of fruits and vegetables, and poor quality protein. By far, the most extensive pathology is systemic bacterial infection which cannot be attributed to a specific organism. Two of the four cases of rib periostitis are not associated with other bone lesions and probably resulted from chronic pulmonary infections such as pneumonia or even tuberculosis (Kelley and Micozzi 1983:212). The pattern of childhood deaths can contribute to the diagnosis of this phenomenon. The childhood deaths begin at three months of age and slowly increase to a peak at 18 months where 41.2% of the deaths occur. Taken together these lesions indicate severe dietary deficiencies combined with chronic infections all combining together to produce a peak mortality at 18 months, the age of weaning.

The Cedar Grove phenomenon can be better understood by looking at some examples. Examination of the Carib causes of death (Table 6-10) during the second year shows a shift from the natal pattern to one of diarrhea and worms. Scrimshaw et al. (1968) used third world data to define a syndrome called weanling diarrhea which causes numerous deaths. This syndrome can be described as follows. The infant is developing normally on breast milk alone which supplies good quality protein, other nutrients and antibodies. At three to six months of age supplementary feeding begins and if the food is low in protein the child will slowly approach negative nitrogen balance (i.e., protein malnutrition). When weaning occurs at anywhere from 12 to 24 months, the diet is low in protein and other nutrients and the child's resistance to disease quickly declines. A cycle of diarrhea and infectious disease begins which quickly saps the child's resources and causes death. A similar pattern has been recognized among prehistoric North American groups, especially those who were corn agriculturalists, which is characterized by the co-occurrence of cribra orbitalia, endocranial periostitis, and systemic periostitis (Lallo et al. 1977; Mensforth et al. 1978; Palkovich 1981; among others). The similarity of lesion pattern and the modal mortality age of 18 months indicates that the weanling diarrhea was responsible for many of the Cedar Grove childhood deaths. The frequency and extent of the lesions at Cedar Grove indicate that the available childhood diet was low in protein, vitamins and other nutrients, which describes the typical, southern, corn-based diets. Further interpretations of these data are provided in the following chapter.

The adult paleopathology pattern is far more diverse and exhibits a number of different lesion complexes. Again, the high lesion frequencies (i.e., 100% for the 15 males and 86% for the 21 females) supports the acceptance of the high mortality rate as a valid reflection of the Cedar Grove stress load. The frequency of healed cribra orbitalia (males, 13.3%; females 0.0%) and remodeled porotic hyperostosis (males, 33%; females 23.8%) indicates prior experience with iron deficiency anemia. The two cases of active periostitis on the pleural surfaces of the ribs were probably due to

chronic pulmonary infection. The most likely diagnosis is pneumonia although tuberculosis cannot be ruled out despite the absence of the characteristic spinal lesions (Kelley and Micozzi 1983). The more characteristic bone lesions of tuberculosis may not be present in the sample because severe cases would have been sent to sanatoria. The high healed periostitis rates of the lower limbs for males (60.0%) and females (52.4%) is interesting. Several of the lesions exhibit the morphological features of subperiosteal hemorrhage which are characteristic of adult scurvy (Ortner and Putschar 1981:270-272). Although these lesions could be the scars of previous subadult systemic infection, their restriction to the lower limbs suggests otherwise. Except for the frequency, which is more than twice as high, the lesions resemble those of the preceding prehistoric groups (Rose et al. 1982), which suggests a chronological continuity of causal agents. The locations on the lower limbs imply an association with frequent trauma, associated with farm work, where bacterial organisms are introduced into the wounds. If the person's resistance is low the infections can flourish and osteomyelitis results. The high frequency of periostitis is not so much a reflection of pathogen availability, but of the people's low resistance to disease. This suggests conditions of high stress and poor nutrition for Cedar Grove adults.

The high frequency of male spinal osteophytosis (46.7%), Schmorl's nodes (33.3%), combined with similar osteoarthritis rates for the major joints (33.3%), hands (13.3%), and feet (26.7%) indicate a hard physical life style with severe back stress. The females exhibit a similar pattern of spinal osteophytosis (33.3%), Schmorl's nodes (19.0%), and osteoarthritis of the major joints (28.6%), hands (19.0%), and feet (19.0%). These rates are lower than the male's and may imply less strenuous occupations for females, but the rates are not age adjusted and the females have a much higher proportion of young individuals. With their younger age in mind, the higher female hand osteoarthritis rate may indicate that female occupations made strenuous use of the hands.

The presence of interpersonal violence is possibly suggested by the high frequency of healed fractures which might be attributed to blows. The males exhibited 20.0% healed cranial fractures, 13.3% healed rib fractures, and one fatal bullet wound. Characteristically, the incidence of these lesions is much lower for the females with only two (9.5%) cases of healed rib fractures and one fatal bullet wound.

Although not directly evident from the skeletal lesions, the high female mortality between 30 and 40 years of age requires comment. The high frequency of neonatal infections suggests the possibility of high maternal infection which could have contributed to the high mortality rate of women of childbearing age. In addition a high birth rate in conjunction with poor nutrition could have so stressed the females that death toward the end of the fertile period would have been common. This contention is supported by the 1900 census which indicates that 17.6% of the males interred in the Cedar Grove cemetery had more than one wife (Chapter 2). In addition the 1900 census data on individuals interred at Cedar Grove indicates that the women had a mean of four children per female with a low of zero and a high of ten. This is a high birth rate when it is noted that several of these women had not passed their fertile period when the census was taken. This hypothesis of high maternal mortality deserves further documentary research.

In conclusion, the Cedar Grove paleopathology indicates high congenital infections and poor weaning diets resulting in weanling diarrhea. The adult lesions suggest lowered host resistance (i.e., lower limb periostitis), poor nutrition (i.e., periostitis, cribra orbitalia, porotic hyperostosis, and subperiosteal hematoma), and a strenuous physical life style (i.e., osteophytosis and osteoarthritis).

GENETIC AFFINITIES

The biological concept of race has engendered considerable debate and often emotional treatment by anthropologists especially concerning its research potential and biological relevancy. The biological concept of race has been further complicated by the existence of a variety of sociological, philosophical, and legal definitions. Nowhere else can this be more plainly seen than in the biological, philosophical, and legal debates concerning the validity of slavery in the antebellum United States. Stampp (1956), in his monograph The Peculiar Institution, provides an excellent summary of this debate. This debate has extended into modern historiography with researchers taking polarized stances on the influence of racial biology on the institution of slavery (David et al. 1976; Fogel and Engerman 1974; Gutman 1975; Kiple and King 1981; Savitt 1978). For this reason the genetic affinities of the Cedar Grove sample is considered an important component of the research design.

Sociologically the Cedar Grove community and the people interred at the Cedar Grove Cemetery are considered by themselves and others to be Black Americans of African ancestry. The approach employed in this initial research phase is to use the techniques of forensic anthropology to assign individuals to specific "racial" categories. Both cranial morphology as described by Krogman (1962) and the Giles and Elliot (1962) discriminant function formulae are employed. The more appropriate and possibly more informative population analysis using metrics, nonmetric traits, and dental morphology (Corruccini 1974) will have to await future analysis.

Only 28.6% of the adult skulls exhibited sufficiently distinctive facial and cranial morphological features which could be used by the field observers to make some assessment of population affiliation. This low frequency of observations resulted from frequent facial breakage and lack of time in the field laboratory for reconstruction. Using morphological features, seven adult females were assigned to the Black American group (i.e., Burials 14, 21, 31, 47, 70, 86, and 93). Only three (21.4%) of the male skulls were classified. Burial 87 exhibited nasal guttering, maxillary prognathism, and broad nasal contours which are typical features of Black Americans. Burial 89 produced no distinctive Black features, but did exhibit a typical European cranial profile. Burial 92 exhibited clearly neutral morphological features. Classification of these ten skulls suggests a predominance of African genetic heritage with some populational admixture especially among the males. These criteria are subjective and although useful in forensic work, they do not provide measures of genetic distance. However, both frontal and lateral photographs of all skulls are available for study by a more experienced forensic anthropologist.

Again, cranial fragmentation limited the number of skulls (i.e., 23.8% females and 28.6% males) which provided the eight required measurements for the Giles and Elliot (1962) formulae. The female skulls all clustered tightly along the Black-American Indian axis (Figure 6-3) with two individuals classified as Blacks (Burials 86 and 93) and three as American Indian (Burials 31, 70, and 103). Examination of the distribution of the test sample (Giles and Elliot 1962:154) shows that Black females tend to cluster close to the Black-Indian axis with 10.7% classified as Indian and 1.3% as White. Consequently, the Cedar Grove females do not fall outside the Black range of variation, but interestingly they all fall within the periphery of the range.

The Cedar Grove males, as suggested by the morphological features, do not cluster as tightly as the females (Figure 6-3). Only Burial 87 which exhibited distinctive Black features was placed in the Black category. Burial 89, which exhibited European features, was placed just across the White-Indian axis into the Indian category. Burial 92 is similarly situated just across the White-Indian axis within the Indian range, but falls at the extreme edge of the entire Giles and Elliot (1962:152) distribution. Burial 82, which placed within the Indian range, also exhibited shovel shaped incisors. Unlike the females, the Black males in the original sample were misclassified as Whites 12.0% of the time and American Indian only 2.7%. The Cedar Grove distribution does not closely resemble the distribution of the original test sample.

These unexpected results called into question the validity of the field measurements. However, all of these skulls were measured by Mires who had considerable experience using this technique under the direction of Dr. Owsley (Louisiana State University) and subsequent consultations confirmed her confidence in the metrics. These results also called into question the traditional historical interpretation of the degree of genetic admixture within the southern slave populations. Estimates of White admixture within the slave gene pool vary considerably, but estimates of 10.4% (Fogel and Engerman 1974) and 12% (Stampp 1956) are typical. Corruccini (1974), using nonmetric comparison of Blacks and Whites in the Terry collection, estimates 15% White admixture for the Black sample. In contrast, the small Cedar Grove sample suggests that genetic admixture with American Indians is an important component of the American Black gene pool, at least in southwest Arkansas.

There does not seem to be any doubt about the historical fact of genetic admixture between Native Americans and African derived Blacks both free and slave. First of all many southern slaves were imported by way of the Caribbean Islands where originally both Blacks and Indians were kept as slaves with considerable opportunity for interbreeding. Within the American south Blacks and Indians frequently intermarried, while many American Indian tribes owned large numbers of slaves, especially the "Five Civilized Tribes" of the American Southeast (Porter 1932). When these tribes were relocated to the Indian Territories they brought their slaves with them. Additionally, the Indian Territories served as an excellent hiding place for runaway slaves. Cedar Grove, situated as it is on the edge of the former Indian Territories, (i.e., Oklahoma) may be reflecting this interaction between Blacks and American Indians. This preliminary analysis cannot offer any definitive conclusions concerning the genetic affinities of the Cedar Grove population

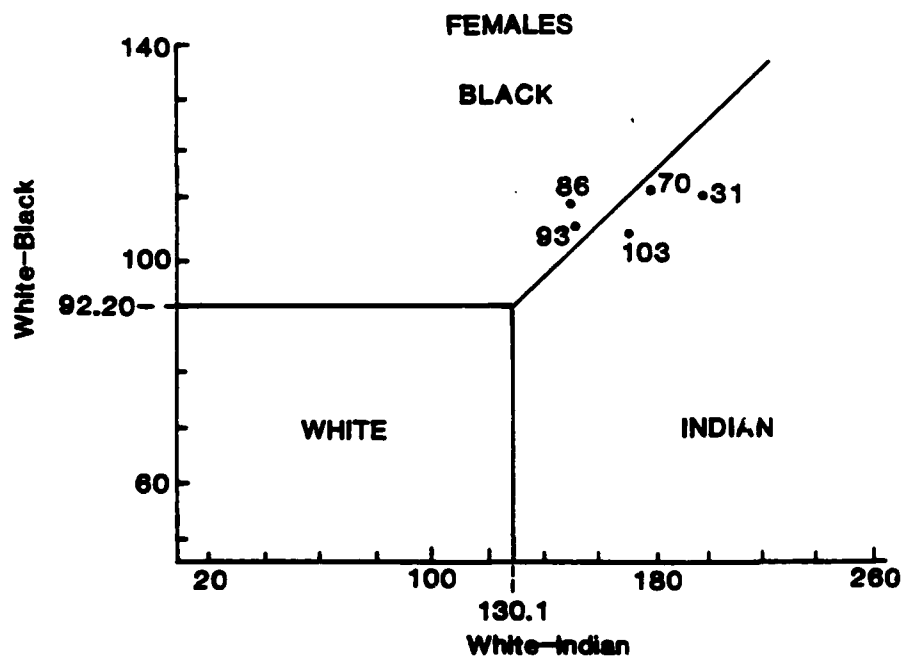
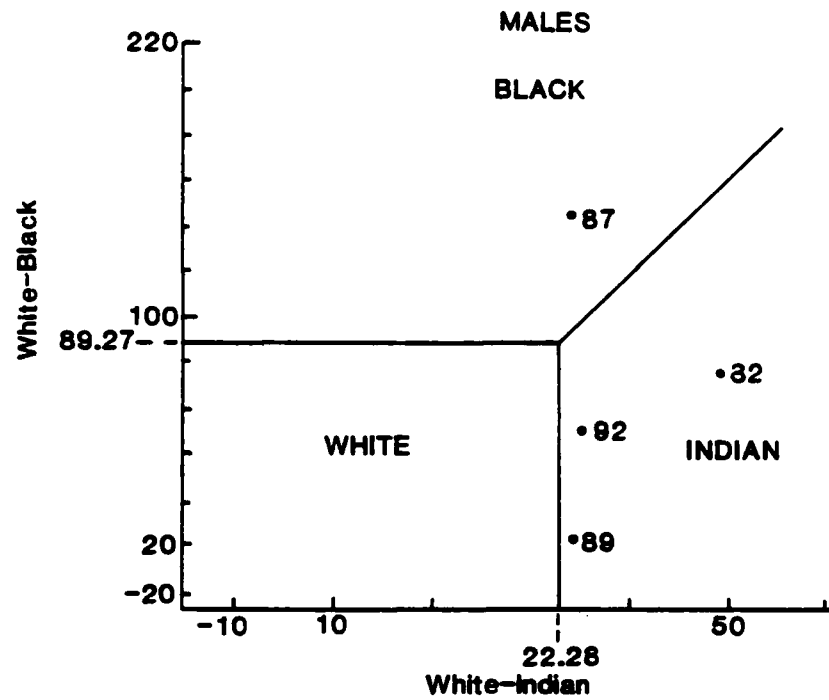


Figure 6-3 Giles-Elliot racial discriminant function for Cedar Grove Cemetery.

but has indicated some interesting problems for future research with the skeletal nonmetric and dental data.

BURIAL DISTURBANCE

Before entering the field we fully expected to find all skeletons to be perfectly preserved and normally articulated in an extended supine position. In actuality, as reported earlier, the great majority of faces were crushed, but more surprisingly only 42.7% of the skeletons were normally articulated. Of the 31 adults whose skeletal position could be conclusively categorized, 41.9% were disarticulated by natural processes, while 3.2% were disarticulated by previous grave relocation. Of the 44 subadults, 52.3% were disarticulated by natural processes, 13.6% were disarticulated by the excavation procedures, while only 34.1% were observed to be normally articulated. The usual pattern of disarticulation was random positioning of the ribs, vertebrae, and in some cases the scapulae and clavicles (Figure 5-5). In a few cases adult burials were almost completely disarticulated with long bones moved considerable distances from their normal positions (Figure 5-14). Rodents could be specifically implicated in a few of the disturbances, but they only disarticulated the feet.

This phenomenon is very difficult to explain. Examination of the in situ positions of the casket hardware suggests that the majority of long bone disarticulations resulted from casket collapse which tended to shift large objects to one side or the other. This situation implies that upon collapse the casket was empty except for the skeleton, thus opening the possibility that the caskets would fill with water and some of the small bones of the thorax would float out of position. If this explanation was the cause, it would seem that small bones should be randomly distributed about the casket which in fact is not the case. Most bones were not far from their original position, they were just jumbled together. The only other alternative is that the normal process of decomposition in an open space results in active transport of the thoraxial bones. This phenomenon requires further consideration and analysis because of its importance to prehistoric bioarchaeology. There have been cases where prehistoric skeletons have been recovered partially disarticulated and have been interpreted to represent secondary reburial with the skeletons reassembled by the prehistoric peoples, who were either careless or did not know their skeletal anatomy.

Chapter 7

CEDAR GROVE AND BLACK AMERICAN HISTORY

by Jerome C. Rose

The history of Black Americans is a complex subject which has engendered heated historical debate for more than a century. Much of the debate has been focused on the quality of Black life and existence, especially diet, mortality, and health. Historians have used historical documents, demographic data, and health statistics to reconstruct a picture of Black life, but as often occurs, the results are as different as night and day. More recently osteologists and archeologists have contributed primary biological evidence derived from excavated human skeletons, which can be used to test some of the historical reconstructions (e.g., Angel 1976; n.d.; Angel and Kelley 1983; Aufderheide et al. 1981; Beck 1980; Corruccini et al. 1982; Handler et al. 1982; Rathbun and Scurry 1983). The most significant contribution which the Cedar Grove Cemetery sample can make is a similar attempt to interpret the osteological data within the context of ongoing historical research. In order to achieve this stated goal this chapter provides a short synopsis of Black history, which concentrates on the pertinent topics of diet, mortality, and health. For purposes of this chapter Black history is divided into three periods: Slavery, up to 1865; Reconstruction, 1865 to 1877; and Post-Reconstruction, 1877 to 1930.

To this author no other aspect of American History seems to generate so much interest, emotional involvement, and research as the institution of southern slavery. The modern debate about the quality of Black life under the institution of slavery probably begins with the publication of The Peculiar Institution by Stampp (1956). Stampp (1956), a revisionist historian intent on changing accepted opinions, makes three generalizations about southern slavery: (1) slavery was not an economic necessity for the south because the greatest portion of agricultural output was produced by nonslave labor; (2) Blacks were no better suited for work than whites under the difficult climatic and disease conditions of the south; and (3) although slavery did function economically, the system was not humane and the living conditions for slaves were substandard. In 1974 Fogel and Engerman's Time on the Cross appeared and, although somewhat obtuse in reference, was a direct criticism of Stampp's (1956) work. Fogel and Engerman (1974), employing what they claim is the new field of cliometrics, refute Stampp's three points and argue that: (1) slavery was a valuable and economically productive system; (2) the diet of slaves was more than nutritionally adequate; and (3) the

health and living conditions of slaves were no worse than that of contemporary Whites. Publication of this book prompted an immediate and vigorous attack. Gutman (1975) in Slavery and the Numbers Game produced a critique of Time on the Cross claiming the authors misused data, did not employ proper historiography, and had no time perspective. Essentially Gutman (1975) supports Stampp (1956) and concludes that slavery produced inadequate dietary and health conditions for Blacks. A more detailed critique of Time on the Cross was soon provided by David et al. (1976) where a group of specialists used a wealth of data to refute specific points of Fogel and Engerman's (1974) work.

Stampp's (1956:10-11) contention that Blacks were essentially the same as Whites biologically and thus no more suited to slavery and life in the south than Whites, prompted Savitt (1978) to produce Medicine and Slavery which attempts to refute parts of this generalization. Savitt (1978), using slave dietary, health, and mortality data from Virginia, attempted to show that slaves by virtue of their African genetic heritage did have a disease resistance advantage over Whites. Another important monograph is Kiple and King's (1981) Another Dimension to the Black Diaspora, where the authors enter the Stampp-Fogel and Engerman debate with a new perspective. These authors state that Fogel and Engerman's (1974) contention that the slave diet was adequate is correct, but only for Whites, while differences in Black biology render this diet inadequate (Kiple and King 1981). Of greatest interest to the archeologist and osteologist is that this debate produced a wealth of data concerning Black diet, mortality, and disease which is summarized below as background for interpreting the skeletal data from Cedar Grove.

Using plantation records, manuscript censuses, and other documentary data Fogel and Engerman (1974:115) contend that the slave diet was "not only adequate, it actually exceeded modern (1964) recommended daily levels of the chief nutrients." In contrast to the standard conception of the slave diet as consisting of nothing but fatback and corn, Fogel and Engerman (1974:111) add:

Among the other plantation products which slaves consumed were beef, mutton, chickens, milk, turnips, peas, squashes, sweet potatoes, apples, plums, oranges, pumpkins, and peaches. Certain foods not produced on most plantations were frequently purchased for slave consumption, including salt, sugar, and molasses. Less frequent, but not uncommon, purchases for slaves included coffee, and whiskey. In addition to food distributed to them, slaves supplemented their diet, in varying degrees, through hunting and fishing as well as with vegetables grown in the garden plots assigned to them.

This dietary reconstruction uses historical data to determine what quantities of food were produced and purchased for slave consumption and then calculates the potential allotment for each slave. Sutch (1976) provides a critical review of the statistics and contends that each slave allotment was much lower and that the postulated dietary variety did not exist. The problems with these arguments are that they generalize over a large environmental range and provide no direct evidence of consumption. This problem can be

illustrated by the following example. While Fogel and Engerman (1974:111) contend that slaves supplemented their diets by hunting and fishing, Kiple and King (1981:87) counter with the suggestion that the fruits of these endeavors were sold. Gibbs et al. (1980) summarizing slave archeology along the south Atlantic coast report finding fish and animal bones in slave middens which indicates that these resources were indeed eaten by slaves.

One direct biological measure of nutritional adequacy uses morbidity and mortality statistics. Using the available documentary data the following slave dietary deficiencies have been postulated: the 70-77% lactose intolerance rates of Blacks contributed to low milk consumption and calcium deficiency (Kiple and Kiple 1977; Kiple and King 1981); the low niacin content of the slave corn and pork diet resulted in pellagra (Gibbs et al. 1980; Sutch 1976); the low bioavailability of iron in a corn based diet combined with frequently inherited Black blood abnormalities (e.g., sickle cell); produced frequent anemia (Kiple and Kiple 1977; Kiple and King 1981; Sutch 1976); low milk consumption combined with dark skin produced vitamin D deficient rickets (Kiple and King 1981; Sutch 1976); the low amino acid proportions of tryptophan, lysine, and methionine in both corn and pork proteins contributed to protein malnutrition (Kiple and Kiple 1977); and other dietary inadequacies such as thiamin deficiency causing beriberi (Sutch 1976) and magnesium deficiency which lowers resistance to infection (Kiple and Kiple 1977) have been mentioned. These researchers, on the whole, conclude that the southern slave diet was inadequate. In contrast, Gibbs et al. (1980) using all the available historical, demographic, and archeological data conclude that, at least along the south Atlantic coast, slave diets were indeed nutritionally adequate. These divergent conclusions suggest that slave diets cannot be evaluated for the south as a whole but that each ecological region must be examined separately. Consequently, the data specific to southwest Arkansas is reviewed.

Taylor (1958:134-138), using traditional historical methods, concludes that the southwest Arkansas slave diet was adequate and included: corn, pork, and molasses supplemented by wild game (i.e., bear, fish, ducks, turtles, squirrels, rabbits, turkey, and quail), sweet potatoes, beans, peas, turnips, fruits in season, and wild fruits, nuts, and berries. Both prehistoric data and historic documents support the contention that southwest Arkansas abounded in natural food resources (see Trubowitz 1983). Both plantation owners and slaves in this area had a distinct advantage over other southern plantations in that settlement was so recent that the natural food resources had not yet been overexploited. Watkins (Chapter 2) notes that large quantities of animals were raised in southwest Arkansas as well as rye, oats, potatoes, peas, beans, and rice. Genovese (1974:535-6) notes that Louisiana slaves were usually provided with garden plots and it is possible that a similar practice was followed in adjacent southwest Arkansas. Unfortunately, there are no quantitative data yet available which would permit a more precise evaluation of the Arkansas slave diet. However, as was the case along the ecologically rich south Atlantic coast (Gibbs et al. 1980), the rich Red River ecotone could have provided adequate slave nutrition in the Cedar Grove locale. Detailed historical and archeological research must be done before the slave diet at Cedar Grove can be accurately reconstructed. In summary this discussion indicates that on the whole the southern slave diet was inadequate, but at least in certain areas the opposite can be shown.

Another indicator of the quality of slave life is the mortality rate. Although all researchers using the available demographic data agree that slave mortality rates were higher than the contemporary White rate (Fogel and Engerman 1974:123; Kiple and King 1981:100; Sutch 1976:285), they do not agree on the amount of difference. For example, the following slave infant mortality rates per 1000 have been reported: 137 (Kiple and King 1981:100), 183 (Fogel and Engerman 1974:123), 194 (Gibbs et al. 1980), and 209 (Sutch 1976:285). No definite conclusions can be drawn from these data except that the mortality rates indicate a consistently lower quality of life for slaves than for Whites. The only available data for Arkansas slaves is that the slave mortality rate was 1.8% while the White rate was 1.3% (Taylor 1958:158). It should be noted that the slave rate is identical to the 1.8% reported by Stampp (1956:318) for the entire south. Until detailed historical demography is done for southwest Arkansas it will not be possible to compare this region to the rest of the south.

Comparison of the archeologically derived average skeletal ages at death between Whites and Blacks do not show any consistent differences. Rathbun and Scurry (1983) compiled the average antebellum skeletal ages for Whites and Blacks (Table 7-1) and were unable to demonstrate a meaningful difference. These ages are well above the average slave age at death of 21.4 years (Stampp 1956:318). Part of this difference between the skeletal and documentary ages is due to small sample sizes and under recovery of infant and young adult skeletons. For example, the average age at death for the Barbados Newton Plantation slave skeletal sample is 29 years, while the plantation records indicate an age of only 20 years (Corruccini et al. 1982).

Examination of the extensive slave morbidity and cause of death data tend to support the contention of poor health and inadequate nutrition among southern slaves. It was a common statement of antebellum defenders of slavery that Blacks were more suited to life and work in the hot disease ridden environment of the south than Whites (Kiple and King 1981; Savitt 1978). In fact, contrary to Stampp's (1956) opinion, Blacks did have a biological advantage over Whites in resistance to malaria, yellow fever, and hookworm (Savitt 1978; Kiple and King 1981) as well as to cystic fibrosis and skin cancer (Savitt 1978). With the exception of these diseases the evidence overwhelmingly demonstrates that Black morbidity rates were significantly higher than for Whites (Savitt 1978; Stampp 1956:300-306; Kiple and King 1981). Again the evidence supports the conclusion that southern slave quality of life was below that of contemporary Whites.

Of particular interest to this chapter is the differential morbidity between slaves and Whites in Arkansas. Taylor (1956:157) shows that slaves suffered greater mortality from seven (58%) of his twelve reported causes of death in Arkansas (Table 7-2). These data differ significantly in the relative importance of specific slave causes of death from other southern locales, but do agree with an overall higher morbidity rate for Blacks (Kiple and King 1981; Savitt 1978). For example, Savitt (1978:144) lists the following diseases in descending order of importance for causes of slave deaths in Virginia: respiratory diseases, tuberculosis, diarrhea, nervous system diseases, old age, dropsy, typhoid, whooping cough, accidents, digestive system diseases, diphtheria, measles, maternity, teething, smothering, scarlet fever, heart diseases, rheumatism, neoplasms, and urinary

TABLE 7-1

Average Age at Death for Available Ante-bellum
Skeletal Material*

	Bellview Plantation	Clifts Plantation	College Landing	Catoctin Furnace	Colonial U.S.
White Males	30.3	31.8	—	—	39.6
Black Males	40+	30.5	36.3	35.7	35.7
White Females	32.0	37.0	—	—	31.9
Black Females	45+	34.0	36.2	35.4	38.6

*Derived from Rathbun and Scurry 1983.

TABLE 7-2

Causes of Death (1849-1850) in Arkansas by Percent*

Disease	Slave	White
Cholera	31.3	7.5
Malaria	17.1	32.4
Worms	9.6	6.9
Pneumonia	9.4	11.7
Whooping cough	7.6	1.4
Croup	6.2	9.8
Dropsy	5.2	4.4
Consumption	4.4	9.2
Scarlet fever	3.8	6.6
Convulsions	2.2	1.3
Inflammation of brain	2.2	4.3
Dysentery	1.0	4.4

*Modified from Taylor 1958:157.

system diseases. Important differences between Arkansas and other areas of the south include the greater importance of respiratory diseases, tuberculosis and diarrhea outside of Arkansas (Kiple and King 1981:75; Savitt 1978:42, 144). Although this may simply reflect poor medical recording in Arkansas, the lower ranking of these three diseases may indicate better nutrition among Arkansas slaves. Not evident in the mortality data is the high frequency of injuries among Arkansas slaves from cuts from hoes, scythes, and gin machinery; fights; knife cuts; falls; and animal bites (Taylor 1958:160).

These vast differences in disease frequencies are not supported by the available antebellum skeletal paleopathology. A compilation of all paleopathology data from the Bellview Plantation, Clifts Plantation, Catoctin Furnace, and College Landing sites by Rathbun and Scurry (1983) shows a White periostitis rate of 27% (N=15) and a Black rate of 17.3% (N=52). It should be noted that all White periostitis cases are from Bellview Plantation. In contrast, two slave burials from St. Catherine's Island both died traumatic deaths (i.e., shot) and exhibited periostitis (Thomas et al. 1977), while from a total sample of 20 white males from St. Marks Military Cemetery (ca 1818-1819) only one infection (an infected finger) was found (Dailey et al. 1972). Herniated vertebral disks in young males and osteophytosis of the lower vertebrae in females indicate that Blacks engaged in heavy labor at Bellview Plantation (Rathbun and Scurry 1983). The presence of marked shoulder arthritis at both Bellview Plantation (Rathbun and Scurry 1982) and Catoctin Furnace (Angel and Kelley 1983) again indicate that Blacks were engaged in heavy physical labor. However the combined fracture rates between Whites (13.3%, N=15) and Blacks (12.9%, N=31) are identical, indicating that the frequency of accidents did not vary between the two groups (Rathbun and Scurry 1983). Rathbun and Scurry (1983) conclude from their work with the Bellview skeletons that the similarities between Blacks and Whites were more pronounced than the differences. At present it must be concluded that the great disease differences between slaves and Whites reported by historians cannot be confirmed with the extant reported paleopathology data. The sample sizes are small and further work with additional material, constantly being excavated, may significantly change this conclusion.

In summary, the consensus opinion is that the institution of southern slavery produced a poor quality of life for the Blacks which included inadequate diets, high morbidity, and increased mortality. The specific conditions for slaves in southwest Arkansas is still very much in doubt. There is evidence from the historical records and the decreased importance of tuberculosis, respiratory diseases, and diarrhea that the slave diet may have been more adequate than other slave holding regions. However, the mortality data still indicate a slave-White differential.

Where we suffered an embarrassment of riches concerning diet, morbidity, and mortality for Blacks prior to the Civil War, after emancipation we enter a gray area of inadequate data. Part of this problem can be attributed to the lack of record keeping and inadequate census data resulting from the turmoil of "carpetbag rule" in the former Confederacy. During Reconstruction (1865-1877) Black life went through a major transformation (see Magdol 1977; Richardson 1965; Wallace 1888; and Stamp 1965 for detailed descriptions). During this period former slaves began the transition from a life dictated by

others to one of self responsibility. This transition was aided by temporary provision of housing, food, and medical care by the military and other government and private agencies, as well as the formation of the Freedmen's Bureau which assisted with contract negotiations, education, and other advisory services (Bentley 1970; Magdol 1977; Richardson 1965; Stamp 1965). This transition is most important for this study because of the potential changes in diet, morbidity, and mortality that these changes in Black social and economic status produced. Because of limited health related data (not political and social history) the Reconstruction and Post-Reconstruction (1878-1930) periods are considered here as a single period of changing circumstances.

Once again there is considerable disagreement concerning the quality of Black life during and after Reconstruction. Stamp's (1965) assessment is that with the help of the Freedmen's Bureau the emancipated Blacks settled into the trades and farming and that on the whole, despite occasional acts of violence, the quality of life was good. In contrast, Fogel and Engerman's (1974:261) monograph "suggests that the attack on the material condition of the life of Blacks after the Civil War was not only more ferocious, but, in certain respects, more cruel than that which preceded it." Farley (1970:7) states that his assessment of the historical literature is that there was a decline in the Black standard of living between Reconstruction and the 1930's. "Accounts of rural living conditions stress the difficulties most Blacks faced keeping themselves alive. They note the shortages of food, the prevalence of disease, and the lack of medical services in rural areas" (Farley 1970:7). It is to this controversy that analysis of the Cedar Grove skeletal data can make a contribution.

Specific dietary data for this time period are rare and unlike the preceding slavery period, there are only generalizations to work from. Donald (1952:47) indicates that on the whole the diet of South Carolina Blacks was coarse and consisted of hominy, cornbread, fat bacon, some pork, coffee, rice, molasses, and occasional vegetables. Similarly Kiple and King (1981:189) state that diet went from bad under slavery to worse under freedom. There are two factors that account for this poor diet. First is the fact that most people will continue to consume a traditional diet despite economic and social changes. It is reasonable to assume that rural southern Blacks continued to prefer the same basic dietary regimen as existed under slavery. This does not mean that they would not have attempted to improve the variety of their diet, which brings us to the second point, that the social and economic condition of most rural southern Blacks prevented them from obtaining those foods which would have provided a balanced diet.

Within the Cedar Grove locale it is not certain exactly what actual dietary changes occurred after emancipation. The 1866 contract negotiated by the Freedmen's Bureau between the Blacks and Sentells called for the provision of a wage, rations, housing, and one acre of land per household in exchange for labor on the plantation (see Chapter 2). At least at this stage Black diet was still basically determined by the landowner. Under the terms of this contract the Blacks were permitted to own no livestock except poultry, thus they certainly had no control over their protein sources. It should be noted, however, that now being free the Blacks should have been able to utilize the abundant natural resources of the area. At least during this period the Cedar Grove diet should have been adequate.

This contract labor system soon came to an end and, as elsewhere in the south, the large plantations were broken into individual allotments which were farmed by Blacks under a sharecropping arrangement. Although there is as yet no specific data for Cedar Grove, the system of advancing loans for seed and supplies usually served to keep the sharecroppers poor and in debt (Christensen 1958). Conditions began to deteriorate rapidly in 1888 with a rapid decline in cotton prices which left all southern Arkansas farmers, both Black and White, poor and in debt to the stores (Graves 1967:30). A further disaster occurred with the arrival of the boll weevil in southwest Arkansas in 1905 (Sylva 1981:52). These economic conditions contributed to a deterioration in the political climate, which was stimulated by the White agrarian revolt. The process of segregation and political disenfranchisement began with the passage of new voting laws and the first Arkansas Jim Crow law (i.e., the separate coach act) in 1891 (Graves 1967:94). From this point on Blacks lost all political gains from Reconstruction and by 1894 Blacks were effectively out of Arkansas Government (Graves 1967:61). These political and social changes, in combination with the farm price crises, should have seriously and adversely impacted Black diet and health in the Cedar Grove area.

An exact understanding of Black demographic processes between 1860 and 1930 will never be achieved because of the questionable quality of the 1870, 1890, and 1920 censuses, especially for rural southern Blacks (Farley 1970). Sylva (1981:16) sees the population decline in southwest Arkansas during this period as the consequence of outmigration. In contrast, Farley (1970:3) observes a national trend of significant slowing of the Black population growth rate between 1880 and 1940. Black women who began childbearing before 1850 and survived until menopause produced an average of seven children and less than 10% of these women produced none. Women born between 1900 and 1920 not only had the lowest fertility before or since, but 50% never had a child and those that did had fewer (Farley 1970:3). These data suggest that a biological crisis occurred for the entire Black population at the turn of the century. The data were so noticeable that Holmes, writing in 1937, prepared a monograph predicting the disappearance of American Blacks.

This phenomenon not only occurred in decreased fertility, but also in greatly increased mortality rates. Urban Black life expectancy at birth in 1900 was 33 years for males and 35 years for females (Farley 1970:61). In 1900 the Black mortality rate was 3.02%, nearly twice that of Whites with 1.73% (Holmes 1937:40; Kiple and King 1981:188). This high mortality rate was observed at all demographic levels in 1900. The nonwhite infant death rate was 275 per 1000 live births (Farley 1970:212), the nonwhite maternal mortality rate in 1920 was still 13 per 1000 live births, while the neonatal death ratio was 72 per 1000 live births (Farley 1970:209). Physicians commonly noted that the Black stillbirth rate was two to three times higher than Whites (Kiple and King 1981:188). Farley (1970:12), in an attempt to explain both the high stillbirth rate and decreased fertility, suggests venereal disease, citing as evidence a 20% infection rate among Black females and a 1900 infant death rate of 2.7/1000 live births due to congenital syphilis.

Examination of the disease pattern (Table 7-3) shows that Blacks suffered a higher mortality rate than Whites from all diseases except cancer

TABLE 7-3

Death Rates Per 100,000 from the More Common Diseases*

	1890		1900	
	Blacks	Whites	Blacks	Whites
Pneumonia	290.3	195.8	363.1	201.8
Heart disease	209.8	122.6	221.7	130.8
Nervous disease	347.2	253.6	103.1	210.6
Diarrhea	268.3	202.6	211.9	140.8
Typhoid	70.0	49.8	68.8	34.8
Cancer	37.1	53.1	49.2	64.8

*From Donald 1952:162.

(Donald 1952:162). Using the 1900 census Farley (1970:70) lists the most frequent causes of Black deaths as tuberculosis, pneumonia, nervous disorders, diarrhea, typhoid fever, and malaria. Both tuberculosis and pneumonia were major killers of Blacks (Kiple and King 1981:188) with Black tuberculosis rates being reported as three times higher than Whites (Holmes 1937:76). Although these data are not extensive they do indicate that the Black-White differential was as large if not larger than before emancipation. Additionally, little difference can be found in the Black disease pattern between slavery and the turn of the century. Most importantly three of the biggest killers (i.e., pneumonia, tuberculosis, and diarrhea) are diseases whose incidence and case fatality rates can be significantly elevated by malnutrition.

The above listed data are derived primarily from the cities of registration and pertain to the nation as a whole and may or may not describe the situation in southwest Arkansas or, in particular, Cedar Grove. The collection and analysis of similar data from Lafayette County, Arkansas (which is in fact planned for future research) is the most appropriate method for testing the applicability of these data and conclusions to the Cedar Grove area. Lacking these data and keeping in mind the limitations of skeletal data, the Cedar Grove Cemetery sample can be used as a preliminary test of the hypothesis that Cedar Grove was similar to the national Black health trends.

Using the cross sectional skeletal demographics as a true birth cohort allows the construction of hypothetical mortality rates. Using the ratio of skeletons less than one year to total skeletons produces an infant mortality rate of 27.5% which is identical to the nonwhite infant mortality rate of 27.5% cited by Farley (1970:212). Using the ratio of skeletons aged younger than birth to total skeletons produces an estimated stillbirth rate of 6.2% which is close to Farley's (1970:209) 1920 nonwhite rate of 7.2%. Although life expectancy calculated from the skeletal data (14 years) is far below the 33 years for males and 35 years for females reported by Farley (1970:61), the average adult skeletal ages (males, 41.2; females, 37.7) are close when the age determination problem is considered. The surplus of females at Cedar Grove may be indicative of the cited high nonwhite maternal mortality rate (Farley 1970:209). The entire Cedar Grove demographic profile suggests a highly stressed community which is exactly what is predicted by the national statistics. In fact it appears likely that when the Lafayette County mortality statistics are collected they will show that southwest Arkansas Blacks were under greater stress than the national Black population as a whole.

There is abundant evidence of dietary deficiencies in the Cedar Grove skeletal sample. The rate of active crura orbitalia among children dying between three and twenty months is 58.5%, while the rates of healed cribra orbitalia (males, 13.3%, females, 0.0%) and porotic hyperostosis (males, 33.3%; females 23.8%) among the adults is also high. The high frequency of these lesions indicates extensive anemia most of which can be attributed to iron deficiency resulting from a reliance upon corn and a lack of red meat. Some of these lesions can be attributed to sickle cell anemia, but this genetic trait should account for only a small percentage of the observed lesions. The 23.5% craniotabes for children dying between three and twenty

months can be attributed to vitamin D deficient rickets due to the lack of milk consumption resulting from a high rate of lactose intolerance. At least some of the extensive childhood periosteal depositions and the ossified hematomas among the adults can be attributed to vitamin C deficiency due to a lack of fruits and vegetables in the diet. The evidence of high rates of specific dietary deficiencies indicate a very inadequate diet in the Cedar Grove community between 1890 and 1927.

The high rate of active systemic periostitis (41.2%) among the children dying between three and twenty months combined with a modal mortality age of 18 months presents a clear picture of weanling diarrhea. This condition occurs when breast milk is supplemented with an amino acid deficient food, in this case corn meal, which eventually, at weaning, leads to protein malnutrition. Protein malnutrition leads to lowered disease resistance and a cycle of diarrhea and infectious disease begins which results in high childhood mortality (Scrimshaw et al. 1968). The fact that diarrhea and pneumonia are reported as leading causes of death for this period (Table 7-3) supports this interpretation of the skeletal lesions. A total of 25% of the subadults exhibit active periosteal reactions on the pleural surfaces of the ribs suggesting the existence of pulmonary infections. This lesion can be attributed to pneumonia and/or tuberculosis (Kelley and Micozzi 1983) both of which are considered major causes of death (Kiple and King 1981:188). High death rates from these two diseases are indicative of poor nutrition and especially protein malnutrition. The adults also exhibit high infection rates with 60.0% of the males and 52.4% of the females having healed periostitis. Most of these lesions are probably the result of the introduction of bacteria into wounds received accidentally. What makes this situation unusual is the low host resistance which allowed the bacteria to produce major infections, which in this situation can be attributed to extremely poor diets. The two adult cases of rib periostitis again suggest pneumonia or tuberculosis although the classic tuberculin vertebral lesions were not found. The high rate of reported deaths from nervous disorders (Table 7-3) suggests pellagra due to the niacin deficient pork and corn diets (Sutch 1976:271), although this disorder cannot be detected on the skeleton. Taken as a whole these skeletal lesions suggest a poor diet, not only deficient in good quality protein, but also in vitamins and minerals. These data suggest that the historical evidence for malnutrition in the Post-Reconstruction period is not only applicable to Cedar Grove, but may even have underestimated the seriousness of the problem. When Cedar Grove is compared to the frequency of antebellum Black skeletal lesions (Rathbun and Scurry 1983), it is evident that the Post-Reconstruction quality of life was worse than it was in antebellum times for either free or slave Blacks.

The pattern of systemic neonatal periostitis (81.8%) and cranial lesions (27.3%) is considered characteristic of a treponemal infection (Palkovich 1981; Steinbock 1976). The diagnosis in conjunction with the presence of Hutchinson's incisors and the advanced state of periostitis on the premature skeletons all indicate congenital syphilis. Additional histological work with the deciduous and developing permanent dentitions may help to confirm this diagnosis. This lesion pattern at Cedar Grove tends to confirm Farley's (1970:12) statement that venereal disease was widespread at the turn of the century and could have been responsible for the documented high neonatal mortality and decreased fertility. It should be mentioned that the existence

of syphilis at Cedar Grove remains in doubt because not a single case of diagnostic skeletal lesions (Steinbock 1976:98-142) was found among the adults.

The Cedar Grove adult males exhibit 20.0% healed cranial fractures and 13.3% healed rib fractures while the females exhibit 9.5% healed rib fractures. These lesions could have been the result of interpersonal violence, an idea which is further supported by the presence of two fatal bullet wounds. A high frequency of violence has been documented for this time period (Donald 1952) and should be expected from the historical evidence of race conflict and social turmoil during this period in Arkansas history (Graves 1967).

A rigorous life style is indicated by the high frequencies of spinal osteophytosis (males, 46.7%; females, 33.3%), Schmorl's nodes (males, 33.3%; females, 19.0%), and osteoarthritis of major joints (males, 33.3%; females 28.6%), hands (males 13.3%; females, 19.0%) and feet (males 26.7%, females, 19.0%). This frequency and pattern of degenerative joint disease at Cedar Grove is consistent with the hard labor engaged in by southern Black sharecroppers and agricultural field hands (Angelou 1970; Christensen 1958). Although specific rates were not reported from Bellview Plantation (Rathbun and Scurry 1983) or Catoctin Furnace (Angel and Kelley 1983) degenerative joint disease of the shoulder and back was common amongst Black slaves. Comparison of Cedar Grove to the slave skeletal data suggests that the amount of physical labor either remained stable or even increased after emancipation.

The last item to be considered is growth and stature estimation for the Cedar Grove skeletal sample. Growth rates for slaves living under the most stressful conditions have been shown to be slower with smaller achieved stature than for those living under more favorable conditions (Higman 1979) which demonstrates the value of growth rates in evaluating overall stress. Similar results have been achieved using skeletal long bone measurements and dental age (e.g., Hummert and Van Gerven 1983). Future research will utilize the subadult metrics from Cedar Grove to evaluate growth rates and subadult stress. Adult Cedar Grove statures were calculated using femoral lengths and the Trotter and Gleser formulae for American Black males and females (Krogman 1962:162). The calculated mean male stature (177.2 ± 6.59) is considerably larger than the male slaves from Bellview Plantation (166.0, Rathbun and Scurry 1983), Catoctin Furnace (171.6, Angel and Kelley 1983), total United States 1828-1860 (171.6, Higman 1979:376), and all antebellum Blacks (169.0, Angel 1976:725). The Cedar Grove male stature even exceeded the 174.6 corrected stature from the Terry Collection (Krogman 1962:159). Similarly the Cedar Grove female mean stature (162.6 ± 5.97) exceeds that of the female slaves from Bellview Plantation (161.0, Rathbun and Scurry 1983), Catoctin Furnace (156.4, Angel and Kelley 1983), and total United States 1828-1860 (158.6, Higman 1979:376). The Cedar Grove female stature even exceeded the 161.3 corrected stature from the Terry Collection (Krogman 1962:159). At first glance the large Cedar Grove stature estimates belie the previously suggested poor nutrition and health at Cedar Grove, but it must be remembered that achieved stature reflects conditions during growth and development. For these measured adults the growth and development period would have been late slavery and Reconstruction when it is possible that diet and health at Cedar Grove were satisfactory.

A number of trends in Black diet, mortality, and health emerged from this discussion of Black history from slavery to modern times. The historical evidence supports the contention that on the whole southern slaves received inadequate diets and suffered greater morbidity and mortality than contemporary Whites, but at least in some areas, possibly including Cedar Grove, the quality of life may have been better. At present the limited skeletal evidence does not support the poor quality of life postulated from the historical southern slave data. Although detailed data are lacking, the Reconstruction period may have been one of improved Black quality of life despite historical controversy on this point. The historical evidence, limited as it may be, clearly indicates that after Reconstruction the quality of Black life rapidly declined reaching a possible crisis stage at the turn of the century. It should be remembered that the greatest bulk of these historical data pertain to urban and northern Blacks and may not accurately reflect the situation of rural southerners. At Cedar Grove the quality of slave life is essentially unknown and there is no reason to suspect that it was as bad as in other slave regions. The Cedar Grove skeletal sample dates between 1890 and 1927 and, thus, can make a contribution to our understanding of Black life in the Post-Reconstruction period. The high infant and adult mortality rates, presence of weanling diarrhea syndrome, high infection rates, and skeletal lesions indicative of nutritional deficiencies all indicate extremely inadequate diets for Blacks in southwest Arkansas. The extent of degenerative joint disease suggests that the amount of physical labor required of Blacks had changed little from slavery times. Evidence of interpersonal violence and traumatic deaths also indicate the social turmoil and violence documented for this period in Arkansas history. All of this skeletal evidence of poor quality of life at Cedar Grove is certainly consistent with historical events such as the fall in cotton prices, arrival of the boll weevil, White agrarian farm revolt, and the violence and social upheaval associated with the beginning of segregation and discrimination in Arkansas.

Chapter 8

SUMMARY AND CONCLUSIONS

by Jerome C. Rose

Before the analysis of any skeletal data can be generalized and placed into historical context, the skeletal series must be considered representative of the once living community and a biological population. The 78 excavated graves comprise 73.6% of the total number of people interred within the direct impact zone of the Cedar Grove Cemetery. The excavated portion of the cemetery represents 40% of the total cemetery population as calculated by Trubowitz from the historic map of the cemetery. Using the tombstone data and dating of the excavated mortuary artifacts, it has been hypothesized that the cemetery was utilized in a chronological sequence from south to north. Both Watkins and Trubowitz used historically reported mortality rates (ca 2-3 persons per year) to suggest that the cemetery was founded ca 1834. All adult grave lots have been dated to 1890-1927 (infant graves produced no datable material), which means that the excavated portion of the cemetery accounts for 40% of the estimate time of cemetery usage and 40% of the estimated number of graves. Using the excavated skeletons and estimated burial period (i.e., 37 years, 1890-1927) produces a mortality rate of 2.8 persons per year which is within the reported mortality rates. These data and inferences suggest that the excavated skeletons represent a chronological slice of the total cemetery population.

There are three additional cemeteries used by the Cedar Grove Church: Mays One, Mays Two, and Wright Cemetery. At present the available historical data suggest that only the Wright Cemetery is contemporaneous with Cedar Grove. It is assumed that each plantation would have had its own slave cemetery (i.e., Cedar Grove and Wright) and that the descendants of these slaves would have continued to bury their dead in their ancestral cemetery. Thus, until shown otherwise, the Cedar Grove Cemetery is assumed to contain the descendants of the Armor and Santell freedmen.

A number of factors point to the normalcy of the Cedar Grove demographics. The 0.71 male-female sex ratio is not statistically different from the expected ratio of 1.0 and the surplus of females can be explained by high female mortality, multiple marriages by males, and limited male outmigration. The proportion of individuals younger than 15 years (i.e., 55%), the infant mortality rate, and computed life expectancy at birth are all consistent with model life table 15.0-45.0 (Weiss 1973:118). The adult mortality rate is slightly high but part of the problem results from the assignment of 27.8% of the sample to 10 year intervals instead of 5, which

will be resolved in future research. Thus, on the whole, the Cedar Grove skeletal sample can be considered representative of a biological population and a temporal sample of the Cedar Grove Black community.

Having established that the Cedar Grove skeletal sample represents a segment of the Black community, the analysis of these data can be placed within the context of Black history from slavery to Post-Reconstruction times. Although considerable controversy exists, the vast majority of evidence supports the contention that the quality of Black life under slavery was substandard at best. On the whole the southern slave diet was nutritionally inadequate, while slave morbidity and mortality rates far exceeded those of contemporary Whites. The estimation of the quality of Black life during Reconstruction is equivocal and probably improved in some places and declined in others. The quality of Black life after Reconstruction is not well known because of deficiencies in the historical data, but the evidence available suggests a rapid deterioration. In fact, the demographic data point to a possible biological crisis for the Black population at the turn of the century. The largest gap in our knowledge of Black life during this period is for rural southern Blacks, a gap which the Cedar Grove data can help to fill.

The earliest settlements along the Red River were established in 1817, but the population did not really begin to grow until the clearing of the Great Raft by the Corps of Engineers in 1838. The Arkansas portion of the Red River Valley rapidly developed a plantation economy using slave labor. The Barnett Plantation, which contained the Cedar Grove site, was established in 1834 and changed hands four times prior to 1865. Although there are no specific data concerning the slaves who worked this plantation, the statistics for the state as a whole show that Arkansas slaves had higher morbidity and mortality rates than contemporary Whites. Again, no specific dietary data are available, but the fact that this area was only recently occupied and was highly productive in natural food resources (i.e., faunal and floral) suggests that the slave diet may not have been as poor as other areas of the south. The fact that the plantation appears to have been a stock raising operation for most of its antebellum history also suggests that the slave diet may have been adequate. After emancipation the plantation was worked by freedmen under contract to the owners for a short while until sharecropping was established.

The Cedar Grove Baptist Church was founded in 1881 by Cage Bryant and has served as the social nucleus of the local Black community until the present day. Economic conditions for the Black sharecroppers began to deteriorate in 1888 as a rapid decline in cotton prices left all southern Arkansas farmers poor and in debt to the stores for seed and supplies. Further economic deterioration occurred in 1905 with the arrival of the boll weevil in southwest Arkansas. These economic conditions were partly responsible for the beginning, in 1891, of Black political disenfranchisement and segregation in Arkansas. These economic, social, and political events contributed to a rapid decline in the Black diet and health as demonstrated by the Cedar Grove skeletal analysis.

Although the Cedar Grove community define themselves and are defined by others as American Blacks of African ancestry, the limited analysis suggests considerable genetic admixture. Of the nine classifiable skulls, two females

and one male were classified as Black, while three females and three males were classified as American Indian. These results present an interesting picture of the Cedar Grove genetic ancestry which deserves further investigation.

Preliminary analysis of the Cedar Grove mortuary behavior revealed the presence of age related status distinctions and a possible economic difference within the Cedar Grove community. The mortuary pattern can best be described by age group and grave lot content. Of the 32 infant burials (0-2 years) none contained casket hardware and only one had a plaque and coins on the eyes. The artifacts suggest that clothing consisted of diapers and gowns. Of the nine child burials (2-13 years), three had casket hardware, two had plaques, and one a bust window. Personal goods consisted of buttons and one necklace. The three adolescents (13-20 years) all had casket hardware and plaques and only one a bust window. Personal goods consisted of buttons and shoes. All six young adults (20-30 years) had casket hardware while four had plaques. Personal goods consisted of buttons, studs, cufflinks, shoes, and variable adornment items such as rings, earrings, and combs. Of the 24 midadults (30-50 years) only three did not have casket hardware while 14 had plaques and five bust windows. Personal goods were numerous and included: rings, cufflinks, studs, combs, earrings, beads, coins, buckles, buttons, snap fasteners, and shoes. All five old adults (50+ years) had casket hardware while there were only three plaques and one bust window. Personal goods consisted only of buttons with the exception of one plate.

The lack of casket hardware for infants possibly reflects the lack of economic commitment common among groups with high infant mortality rates. The one endowed infant burial and variable amounts of casket hardware and personal goods found with children may reflect economic differences among the parents. Adolescents and adults received full mortuary treatment reflecting the importance of mortuary rituals among southern Blacks. The possession of personal goods by adults reflects the acquisition of personal property by full participation in adult economic roles. The virtual absence of personal goods among the old adults may reflect the leaving of full adult economic roles which is commonly indicated by the "passing on" before death of acquired treasures to the next generation.

The poor quality of Black life in rural Arkansas at the turn of the century is adequately documented in the demographics and paleopathology of the Cedar Grove skeletal sample. Using the cross sectional skeletal sample as a synthetic cohort, the following statistics were computed which are directly comparable to national Black demographic trends at the turn of the century: a mortality rate of 2.8%; an infant mortality rate of 27.5%; a stillbirth rate of 6.2%; and a life expectancy at birth of 14 years. Both the Cedar Grove and national Black demographic statistics indicate a severely stressed population which is consistent with the economic and social conditions of that time period.

Preliminary analysis of the skeletal lesions indicates high frequencies of anemia, rickets, scurvy, and protein malnutrition, all resulting from inadequate diets. Protein malnutrition is further indicated by the presence of the weanling diarrhea syndrome characterized by a high systemic periostitis rate (41.2%), active cribra orbitalia (58.5%), and a modal

childhood age at death of 18 months. These data suggest an almost exclusive reliance upon the traditional Black dietary staples of fatback and corn. The nutritional profile of this diet can account for all the nutritional deficiencies observed among the Cedar Grove skeletons.

The frequent systemic periostitis of congenital origin and the presence of Hutchinson's incisors suggest that possible presence of congenital syphilis, which could account for the high stillbirth and neonatal death rates. The presence of rib periostitis among both children and adults suggests the presence of chronic pulmonary infections which could have included both pneumonia and tuberculosis. The high incidence of these three diseases among the turn of the century Black population is amply documented in the historical literature. The high frequency of healed periostitis among both male (60.0%) and female (52.4%) adults points to the continuance of protein malnutrition and lowered host resistance throughout the lives of the Cedar Grove residents.

The high frequencies of spinal osteophytosis (males, 46.7%; females 33.3%), Schmorl's nodes (males, 33.3%; females 19.0%), and osteoarthritis of major joints (males, 33.3%; females, 28.6%), hands (males, 13.3%; females, 19.0%), and feet (males, 26.7%; females, 19.0%) all indicate a hard rigorous life which is consistent with the sharecropping occupations of most Cedar Grove residents. Comparison with antebellum skeletal data suggests that the amount of physical labor required of Blacks had changed little since the time of slavery.

Taken as a whole the results of the Cedar Grove preliminary analysis corroborate the presence of dietary inadequacy, high morbidity and mortality rates among the members of the Cedar Grove community at the turn of the century. Comparison of the statistics obtained from the skeletal series to those obtained from the historical records of the entire American Black population clearly demonstrates that national trends in the deterioration of Black diet and health are reflected in the experience of the Cedar Grove community.

Chapter 9

PROPOSED RESEARCH DIRECTIONS FOR ANALYSIS OF CEDAR GROVE HISTORIC CEMETERY

by Jerome C. Rose and Lawrence Gene Santeford

The nature of the research conducted for this project report can be characterized, at best, as descriptive. The historic artifacts associated with the mortuary components (e.g., casket handles, lid fasteners, nails, etc.) and personal goods (e.g., buttons, cufflinks, beads, etc.) were examined primarily to determine possible interment dates. In some instances information could be obtained from sources of folklore and technical works which suggested explanations for the presence of these specific artifacts. Similarly, the osteological data were organized into gross categories (e.g., periostitis, trauma) which obscured the fine distinctions made on the field data forms. These gross categories were tabulated and the interpretations of pathological and other skeletal patterns were made directly from the tables. This low level analysis of the extensive data sets obtained from the Cedar Grove Cemetery excavations does not even approach the full potential of this material. During the course of report preparation certain problems or gaps in the documentary information became apparent and these areas will have to be addressed in future research. This short concluding chapter presents in outline form the problem areas and research goals that should and are intended to be addressed by future research.

MORTUARY BEHAVIOR

1. The date of interment can be more precisely determined by comparing the casket hardware to historic catalogs of mortuary supply houses. Interviews with the elderly Black mortician residing in the study area could not only explain such practices as the curation of hardware, but also provide clues to their sources.
2. With the mortuary items identified by chronology, sources of procurement, and customary usage, a complete computerized analysis of the intraburial and interburial distribution of mortuary items could be preformed. When the results of this analysis are combined with age, sex, and burial location data a complete analysis of the mortuary program could be accomplished using the theoretical perspective of prehistoric mortuary

analysis. Of special interest is that these conclusions could be compared to the historic and ethnographic information on folk beliefs and customs of Arkansas and other rural southern Black groups. This would provide a unique opportunity to test some of the assumptions and paradigms of prehistoric mortuary analysis against actual cultural behavior. In addition this analysis will permit comparisons of professed and actual mortuary behaviors.

3. Oral history-interview sessions combined with on site investigations of the Wright and Mays cemeteries would confirm or reject the hypothesis that the Cedar Grove cemetery received the same surface decoration treatment as other Black cemeteries. These activities combined with the examination of historic documents would help to confirm or refute the hypothesized simultaneous usage of the Wright and Cedar Grove cemeteries. A clear understanding of historic cemetery usage is required for confirmation of the representative nature of the Cedar Grove Cemetery.

HISTORIC DEMOGRAPHY

1. The demographic profile of the Cedar Grove skeletons suggests that total population stress was at least as high if not higher than the national Black experience as evidenced in the census data. The collection of pertinent demographic data for both Blacks and Whites in Lafayette County at the turn of the century would permit evaluation of this hypothesis. The data sources would at a minimum include: publications, manuscript census, state records, and county birth and death records. Furthermore this investigation would be extended back into the time of slavery for purposes of comparing the Cedar Grove locale to the rest of the south for the entire period of its occupation.
2. It was suggested that because of the emphasis upon herding and the rich natural resources, the southwest Arkansas slaves received a more nutritious diet than elsewhere in the south. It is proposed to collect historic records for the purposes of reconstructing the slave diet for testing this hypothesis. If data on slave morbidity and mortality were collected simultaneously then the hypothesis that the total quality of Cedar Grove Black life declined after Reconstruction could also be tested.

OSTEOLOGY

1. The major demographic problem encountered was the fact that many individuals could not be assigned to five year age intervals. It is proposed that the photographs of the pubes and auricular surfaces as well as the field scores be seriated for greater precision. Additionally, all field scores of age at death should be reanalyzed in conjunction with age data obtained from dental attrition, histological changes in the teeth, and bone histomorphometry.
2. Large amounts of very detailed coded data for pathological lesions were collected in the field. These data will be reanalyzed using computer

technology for determining lesion patterns and their frequency within the skeletal sample. This analysis in conjunction with the development of osteological diagnostic keys should aid in confirming the presence of many modern diseases (i.e., syphilis, tuberculosis, malaria, etc.) at Cedar Grove. Once these analytical phases are completed the pattern of lesions could be compared to mortuary items and spatial distribution of graves to test for the presence of epidemics. This analysis would also be compared to the historical morbidity and mortality data collected from the national, state, and county records.

3. The skeletal analysis suggested the presence of protein malnutrition and a reliance upon the traditional southern dietary staples of fatback and corn. Oral history interviews with the older community members can be used to confirm this hypothesis. Additional research using both trace element and stable isotope analysis of the bone samples can be used to further test this hypothesis. If differential access to nutritional resources can be identified then the suggested economic differential identified in the mortuary analysis could be tested. Further evaluation of the hypothesized nutritional deficiencies could be tested by comparing the long bone growth rates (calculated by regression of long bone length to dental age) to modern, historic, and prehistoric growth data.
4. Histological analysis of enamel defects could help to interpret the pattern of childhood stress. In particular the suggested frequent occurrence of childhood stress could be tested. In addition, the comparison of Wilson bands, childhood mortality, and the pattern of pathological lesions could help clarify the interpretation of Wilson bands within the context of a known disease profile obtained from the historic records.
5. The preparation of histological thin sections of the femur midshafts and the analysis of the histomorphology could contribute to differential disease diagnosis, identification of metabolic disease, and contribute to our knowledge of Black osteoporosis. Test samples have been run and the preservation of the bone histology is of autopsy quality.
6. The whole question of Cedar Grove dental health remains uninvestigated. The patterns of caries, abscesses, dental calculus, premortem tooth loss, and dental attrition need to be reconstructed. These dental data can be used for dietary reconstruction as well as compared to both historic and modern patterns of Black dental health.
7. The preliminary results of the determination of Cedar Grove genetic affinities are interesting and indicate the need for further research. The frontal and lateral skull photographs need to be examined by an expert in forensic anthropology for reevaluation of genetic affinities. The dental molds will be cast and dental morphology data will be collected. The dental morphology, nonmetric skeletal trait, and skeletal metric data can be analyzed in conjunction with known skeletal collections (e.g., Terry) for the determination of genetic distances. These results should be interpreted in light of oral history, census, and name pattern analyses for determining the extent of American Indian

admixture. In addition, these epigenetic data can be compared between burials and in conjunction with grave location and grave goods for the identification of possible family groups.

COMPUTERIZATION OF DATA

The large size of the Cedar Grove historic cemetery data set is both a blessing and a curse. Because of its size, addressing the research topics presented in this chapter necessitated that the data be entered into a computerized data base so as to improve its accessibility. Appendix V presents a detailed proposal for such a data base system.

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APPENDIX I

Arkansas Archeological Survey Skeletal Record Forms

ARKANSAS ARCHEOLOGICAL SURVEY
SKELETAL RECORD

Page 1

SITE NAME: _____ Field Site No. _____
State Site Number _____

PROJECT NAME _____ # _____ FEATURE NO.: _____

RECORDED BY: _____ SKELETAL FSN NO.: _____

Excavation Unit(s): _____

Horizontal Location in Feature: _____

Vertical Location in Feature: _____

BURIAL TYPE:		BURIAL DIRECTION:		N	NE	E	SE	S	SW	W	NW	
primary	_____	trunk										
secondary	_____	skull										
bundle	_____	face										
cremation	_____	R. arm										
multiple	_____	L. arm										
single	_____	R. leg										
partial	_____	L. leg										
skull	_____	BURIAL CONDITION:										
pile	_____											
other	_____											
BURIAL POSITION:		SEX:										
extended	_____	criteria										
fully flexed	_____	pelvis										
semiflexed	_____	robustity										
supine	_____	skull										
prone	_____	identified by:										
L. side	_____	AGE:										
R. side	_____	teeth										
other	_____	pubis										
		epiphyseal										
		general										

Site # _____ Skeletal Catalog # _____

BURIAL INVENTORY:

TEETH: Number refer to adult dentition, letters to deciduous dentition of children

KEY: Symbols to be used in Tooth Inventory

✓8 = tooth present

^8 = tooth present; socket missing

O8 = socket present; tooth missing

~8 = tooth erupting

/8 = tooth not visible, may be in bone

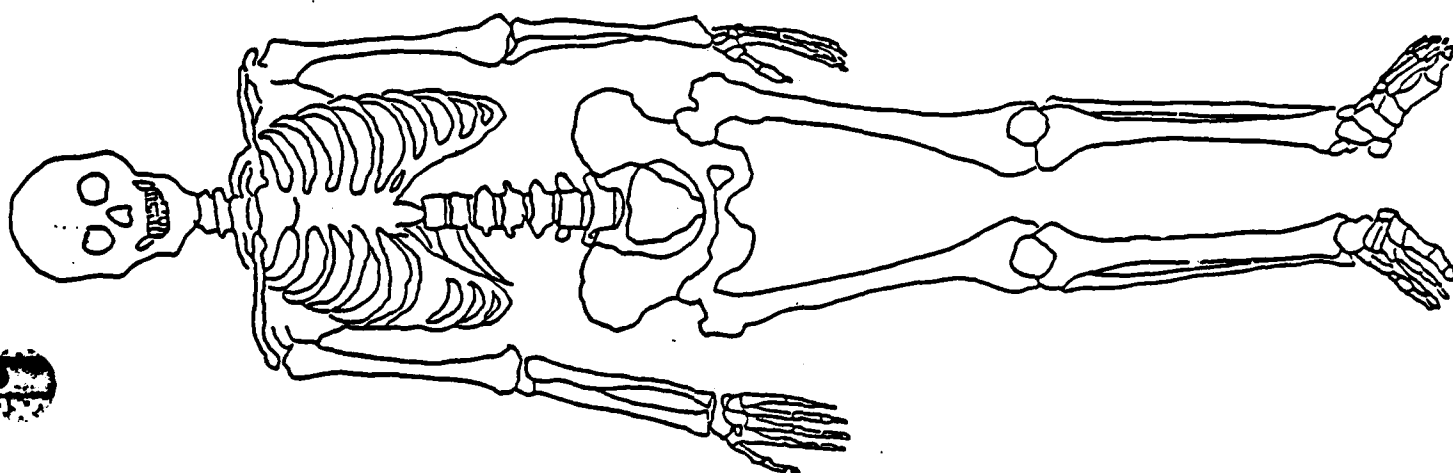
✕8 = tooth destroyed by excavator

			e	d	c	b	a	a	b	c	d	e				
Right	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
				e	d	c	b	a	a	b	c	d	e			

BONE: Key: Symbols to be used in bone inventory

nothing - no bone present

✓ bone present



Left Right

Occipital _____

_____ Parietal _____

_____ Frontal _____

_____ Temporal _____

_____ Sphenoid _____

_____ Ethmoid _____

_____ Ossicles _____

_____ Nasal _____

_____ Vomer _____

_____ Inf Nasal Concha _____

_____ Lacrimal _____

Left Right

_____ Zygomatic _____

_____ Palatine _____

_____ Maxilla _____

_____ Mandible _____

_____ Clavicle _____

_____ Scapula _____

_____ Humerus _____

_____ Ulna _____

_____ Radius _____

_____ Carpals _____

_____ Metacarpals _____

Left Right

_____ Phalanges _____

_____ (fingers) _____

_____ Ilium _____

_____ Ischium _____

_____ Pubis _____

_____ Femur _____

_____ Patella _____

_____ Tibia _____

_____ Fibula _____

_____ Tarsals _____

_____ Metatarsals _____

_____ Phalanges _____

_____ (toes) _____

Bundle Burials

BONE INVENTORY: Key: Circle the number present

Skeletal Record/Page 3

Vertebrae:

Cervical: 1 2 3 4 5 6 7

Thoracic: 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Lumbar: 1 2 3 4 5

Sacrum: 1 2 3 4 5

Coccyx: 1 2 3 4 5

Sternum: Manubrium 1 Mesosternum 2 3 4 5 Xiphisternum 6

Right Ribs: 1 2 3 4 5 6 7 8 9 10 11 12

Left Ribs: 1 2 3 4 5 6 7 8 9 10 11 12

ARTIFACT LISTING : use letters to designate package. Example: 105-A

[illegible]

SCALE:

Do a rough sketch of this burial for the osteologist even if you are doing formal drawing on other paper.

SCALE: _____

NW _____ NE _____

DEPTH _____ DEPTH _____

SW _____ SE _____

DEPTH _____ DEPTH _____

North Arrow:

APPENDIX II

Osteological Data Sheets Cedar Grove Historic Cemetery

CEDAR GROVE HISTORIC

SUMMARY DESCRIPTION FORM
HUMAN SKELETAL REMAINS OF ARCHAEOLOGICAL PROVENIENCE

Observer: _____

Site No.: _____

Date: _____

Lot/Specimen _____

Lot/Specimen _____

Identification: _____

Location: _____

Cultural _____

Horizontal _____ Vertical _____

Affiliation: _____

Age _____

Sex _____

Estimate: _____

Estimate: _____

Number of Bones _____

Number of Teeth Represented: _____

Represented: _____

Permanent _____ Deciduous _____

Cultural Associations: _____

See additional forms (indicate number of forms used in each category):

Summary Inventory of Human Skeletal Elements..... _____

Preliminary Description..... _____

Age and Sex Estimation..... _____

Dentition and Alveolar Bone..... _____

other forms (identify): _____

.....

.....

.....

.....

PHOTOGRAPHS

SPECIMENS COLLECTED

page 2
SUMMARY INVENTORY OF HUMAN SKELETAL ELEMENTS

entry abbreviation code:

blank space, no entry = bone is missing

"frag" = bone incompletely represented

"comp" = all major dimensions available, may be damaged

(for a more detailed accounting, see Preliminary Description Form and/or Summary Description Form)

Cranial, cont'd:		Carpals:	
Frontal	right left	Scaphoid	right left
Temporal	right left	Lunate	right left
Mandible	right left	Triquetrum	right left
Zygomatic	right left	Pisiform	right left
Lacrimal	right left	Gr. Moltang.	right left
Palatine	right left	Is. Moltang.	right left
Inf. max. Con.	right left	Capitate	right left
Malleus	right left	Hamate	right left
Incus	right left	Metacarpals:	
Stapes	right left	I	right left
Mandible	right left	II	right left
Postcranial:		III	right left
Ribs:		IV	right left
1	right left	V	right left
2	right left	Phalanges:	
3	right left	proximal I	right left
4	right left	distal I	right left
5	right left	prx. row II-V	right left
6	right left	mid. row II-V	right left
7	right left	dis. row II-V	right left
8	right left	Tarsals:	
9	right left	Talus	right left
10	right left	Calcaneus	right left
11	right left	Navicular	right left
12	right left	Cuneiform I	right left
Scapula	right left	Cuneiform II	right left
Clavicle	right left	Cuneiform III	right left
Humerus	right left	Cuboid	right left
Radius	right left	Metatarsals:	
Ulna	right left	I	right left
Isominate	right left	II	right left
Femur	right left	III	right left
Patella	right left	IV	right left
Tibia	right left	V	right left
Fibula	right left	Phalanges:	
Ectopic or Anomalous Bones:		proximal I	right left
		distal I	right left
		prx. row II-V	right left
		mid. row II-V	right left
		dis. row II-V	right left

SEX DETERMINATION

Burial No. _____ Site _____
 Catalogue No. _____ Recorder _____
 Sex _____ Age _____

Sex Classification

I. SIZE AND ROBUSTICITY	Score	Weight	Class
1. Supraorbital torus	_____	1	_____
2. Zygomatic arch	_____	1	_____
3. Overall observation	_____	1	_____
4. Diameter Femur midshaft	_____	1	_____
L. _____ R. _____			
5. Minimum Diam. Humerus Head	_____	2	_____
L. _____ R. _____			
6. Maximum Diam. Femur Head	_____	2	_____
L. _____ R. _____			
7. Circumference Femur Midshaft	_____	2	_____
L. _____ R. _____			
	Score	_____	_____
	Total	_____	_____

II. MUSCLE ATTACHMENTS

8. Mastoid process	_____	2	_____
9. Ext. occipital protuberance	_____	1	_____
10. Gonial region	_____	1	_____
11. Linea aspera	_____	2	_____
12. Overall observation	_____	1	_____
Total	_____	_____	_____
Score	_____	_____	_____

III. SHAPE

13. Eye orbit	_____	1	_____
14. Chin	_____	1	_____
15. Cranium	_____	1	_____
16. Femoral angles	_____	1	_____
Total	_____	_____	_____
Score	_____	_____	_____

IV. PELVIS

17. Pubic angle	_____	2	_____
Ischium pubic index	_____		
18. Obturator foramen	_____	1	_____
19. Sciatic notch	_____	2	_____
20. Pubis (Phenice)	_____	2	_____
21. Sacrum	_____	1	_____
22. Pelvic basin	_____	1	_____
23. Acetabulum	_____	1	_____
24. Sacro-iliac region	_____	1	_____
Total	_____	_____	_____
Score	_____	_____	_____

Sexuality Score

Total Class

Total Weight

I	_____	_____
II	_____	_____
III	_____	_____
IV	_____	_____
	_____	_____
	Divided by	_____
Sexuality Score	_____	_____

AGE CLASSIFICATION

Union of Centers of Ossification

	Krogman	Brothwell	
Scapula			
Acromion process	18.0-19.0	17-22	_____
Vertebral margin	20.0-21.0	17-22	_____
Inferior angle	20.0-21.0	17-22	_____
Clavicle			
Sternal end	25.0-28.0	18-30	_____
Acromial end	19.0-20.0	_____	_____
Humerus			
Head	19.6-20.6	16-25	_____
Distal (trochlea)	14.0-15.0	13-19	_____
Medial epicondyle	15.0-16.0	13-19	_____
Radius			
Head	14.6-15.6	13-19	_____
Distal end	18.0-19.0	15-23	_____
Ulna			
Olecranon process	14.6-15.6	13-19	_____
Distal end	18.0-19.0	15-23	_____
Hand			
Metacarpals	15.6-16.6	_____	_____
Phalanges I and II	15.0-16.0	14-21	_____
Phalanges III	14.6-15.6	14-21	_____
Pelvis			
Primary elements	13.0-15.0	13-16	_____
Iliac crest	18.0-19.0	16-23	_____
Ischial tuberosity	19.0-20.0	17-25	_____
Femur			
Head	17.0-18.0	15-20	_____
Greater trochanter	17.0-18.0	15-20	_____
Lesser trochanter	17.0-18.0	15-20	_____
Distal end	17.6-18.6	16-23	_____
Tibia			
Proximal end	17.6-18.6	16-23	_____
Distal end	15.6-16.6	16-20	_____
Fibula			
Proximal end	17.6-18.6	16-23	_____
Distal end	15.6-16.6	16-20	_____
Calcaneal epiphysis	14.6-15.6	12-22	_____
Foot			
Metatarsals	15.0-16.0	12-22	_____
Phalanges I	14.6-15.6	12-22	_____
Phalanges II	14.0-15.0	12-22	_____
Phalanges III	14.0-15.0	12-22	_____
Vertebrae			
Cervical (1-3)	_____	(3-6) _____	(17-25) _____
Thoracic (1-3)	_____	(3-6) _____	(17-25) _____
Lumbar (1-3)	_____	(3-6) _____	(17-25) _____
Basilar Suture (Krogman 18-25)	_____	_____	_____
Dental development	_____	_____	_____
Dental attrition	_____	_____	_____
Cranial sutures	_____	_____	_____
Pubic Symphysis	_____	_____	_____
Todd	phase _____	age _____	
McKern-Stewart-Gilbert	score _____	age _____	
Sacro-iliac surface (Lovejoy)	phase _____	age _____	
Other	_____	_____	_____

Age determination _____

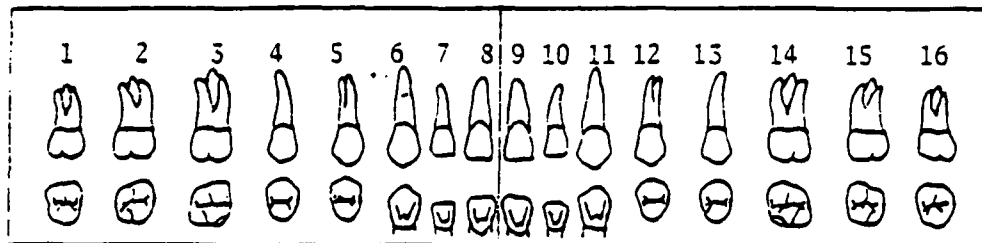
page 5
DENTAL RECORD

MAXILLARY

Site: _____ Burial No. _____ Cat. No. _____

Cultural Affiliation: _____ Sex: _____ Age: _____

Recorder: _____ Date: _____



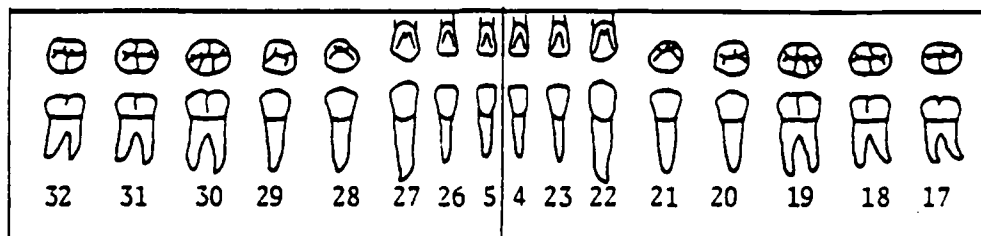
	P/D	Pres.	Erup.	Alveo.	Calcu.	Carie	Abcess		Wear						
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															

DENTAL RECORD

MANDIBULAR

Site: _____ Burial No. _____ Cat. No. _____

Recorder: _____ Date: _____



	P/D	Pres.	Erup.	Alveo.	Calcu.	Carie	Abcess	Wear						
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														

SKELETAL MEASUREMENTS

BURIAL NO. _____

RECORDER _____

CATALOGUE NO. _____

DATE _____

Cranium

1. Max. length _____
2. Max. breadth _____
3. Max. height _____
4. Porion-Bregma ht. _____
5. Basion-Nasion ht. _____
6. Prosthion-nasion ht. _____
7. Bizygomatic brd. _____
8. Orbital ht. _____
9. Orbital brd. _____
10. Nasal width _____
11. Basion-Prosthion ht. _____
12. Bicondylar brd. _____
13. Mandibular lth. _____
14. Ascending ramus ht. _____
15. Symphyseal ht. _____

Scapula

16. Max. length _____
17. Max. breadth _____

Clavicle

18. Max. length _____
19. Circum. Midshaft _____

Humerus

20. Max. Length _____
21. Min. Diam. head _____
22. Circum. Midshaft _____

Radius

23. Max. length _____

Ulna

24. Max. length _____
25. Phys. length _____

Sacrum

26. Max. ant. ht. _____
27. Max. ant. brd. _____

Innominate

28. Max. height _____
29. Max. breadth _____
30. Ischial lth. _____
31. Pubis lth. _____

Femur

32. Max. lth. _____
33. Phys. lth _____
34. Max. diam. head _____
35. Circum. midshaft _____
36. Subtro. A-P diam. _____
37. Subtro. M-L diam. _____

Tibia

38. Max. lth. _____
39. A-P diam. _____
40. M-L diam. _____

Fibula

41. Max. length _____

page8
PATHOLOGY RECORDING FORM

Specimen No. _____
Observer _____

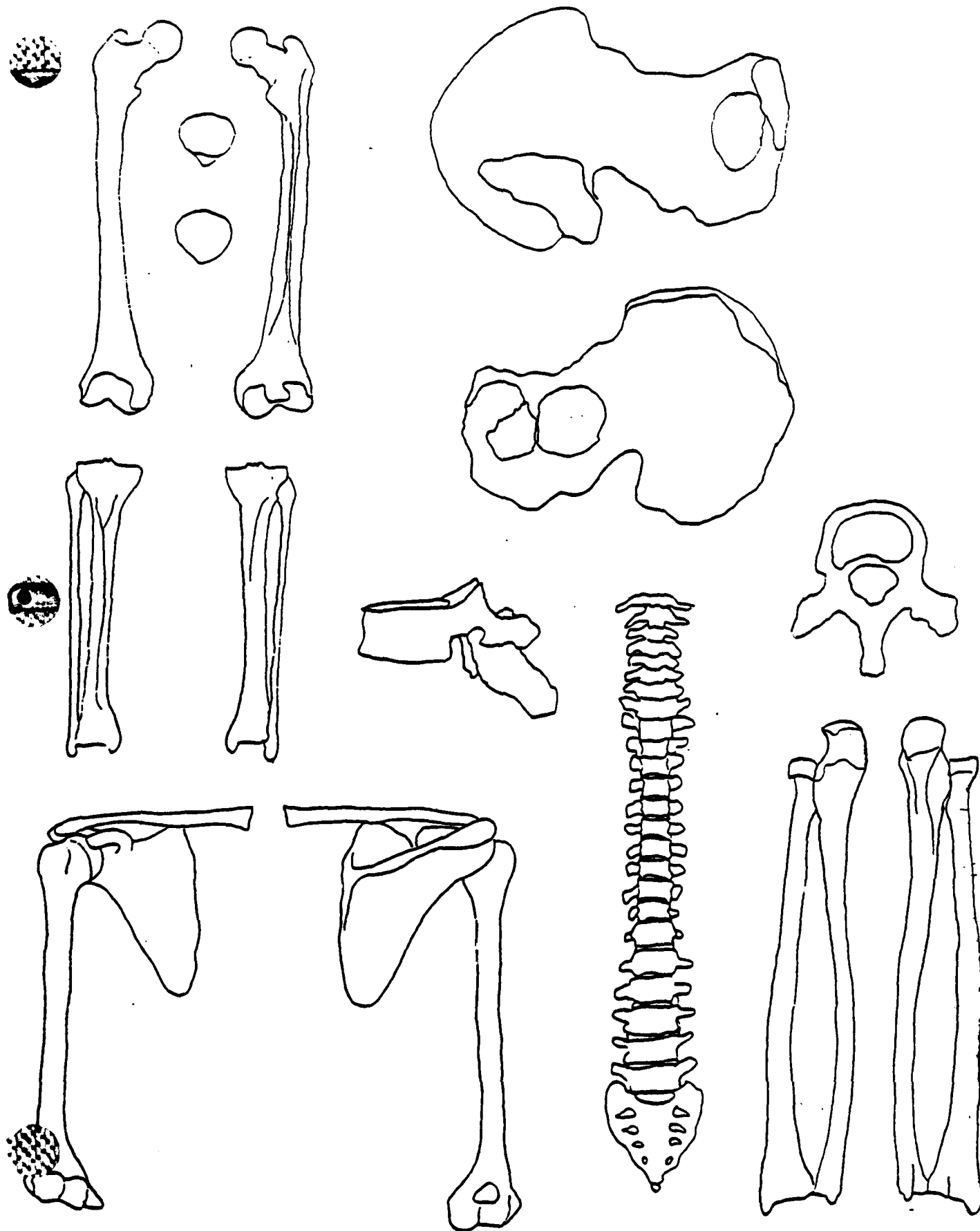
Skeletal Elements Observed	Resorptive Lesions		Osteolytic/ Proliferative Lesions		Trauma		NEOPLASMS	
	L	R	L	R	L	R	L	R
<u>Cranium</u> Calvarium								
Orbit								
Supra-glabellar region								
Face								
Basicranium								
Endocranial Surface								
<u>Mandible</u> Ascending ramus and head								
Body								
<u>Vertebrae</u> Cervical N=								
Thoracic N=								
Lumbar N=								
Sacrum N =								
<u>Ribs</u>								

DESCRIPTION OF PATHOLOGIES:

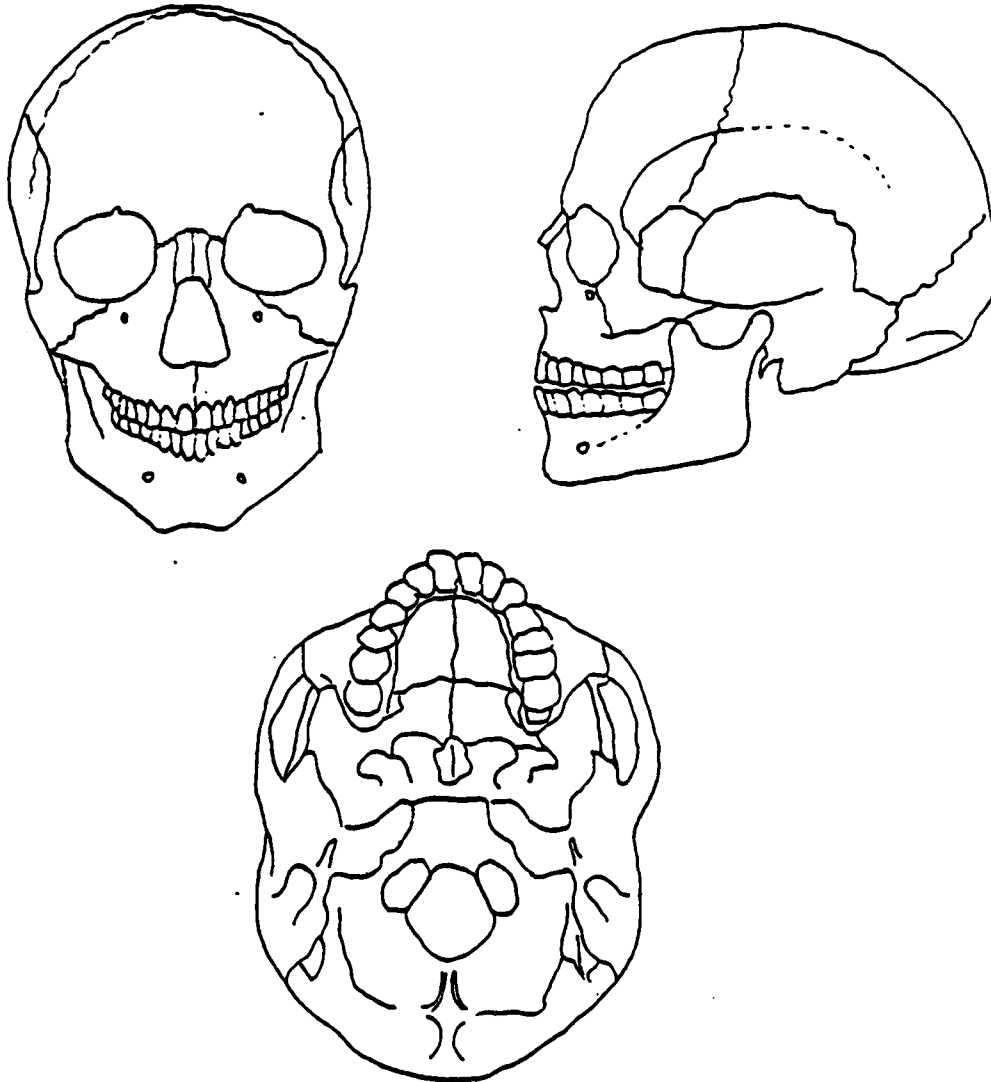
Skeletal Elements Observed	Resorptive Lesions		Osteolytic/ Proliferative Lesions		Trauma		NEOPLASMS	
	L	R	L	R	L	R	L	R
<u>Post-Cranial</u> Clavicle								
Scapula								
Sternum								
Humerus								
Radius								
Ulna								
Hand								
Pelvis								
Patella								
Femur								
Tibia								
Fibula								
Foot								

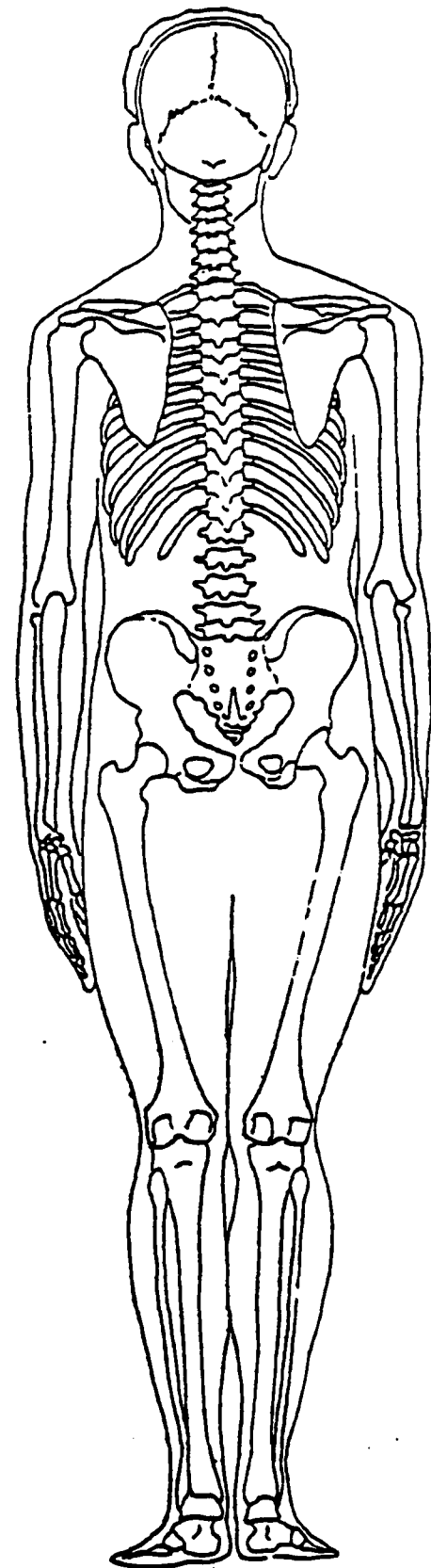
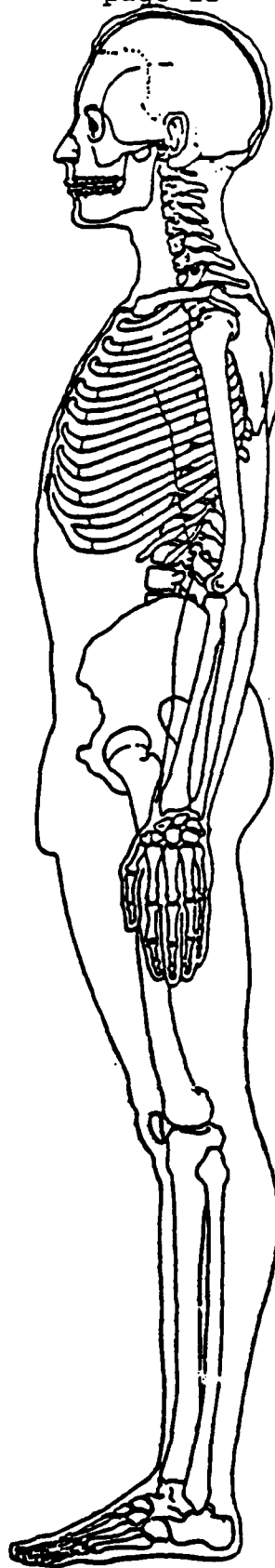
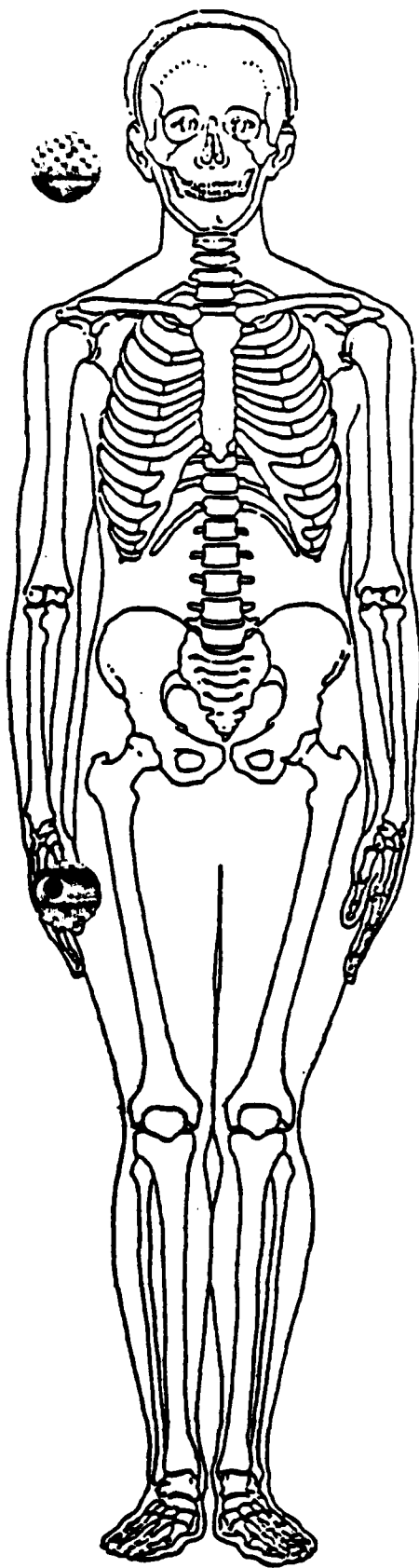
DESCRIPTION OF PATHOLOGIES :

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PATHOLOGY DATA RECORDING FORM - PAGE 1
SCHEMATIC DRAWINGS



PATHOLOGY DATA RECORDING FORM - PAGE 2
SCHEMATIC DRAWINGS





PATHOLOGY DATA RECORDING FORM - PAGE 3
SCHEMATIC DRAWINGS


CRANIAL NON-METRIC VARIANTS
(after Buikstra)

Page 13

Site: _____ Burial No. _____ Cat. No. _____

Recorder: _____ Date: _____

<u>Trait</u>	<u>Right</u>	<u>Left</u>	<u>Medial</u>
Epipteric Bone	_____	_____	
Asterionic Bone	_____	_____	
Parietal Notch Bone	_____	_____	
Os Lambdoid Suture	_____	_____	
Os Coronal Suture	_____	_____	
Os japonium	_____	_____	
Infra-orbital Suture	_____	_____	
Parietal Notch	_____	_____	
Supra-orbital Notch	_____	_____	
Supra-orbital foramina	_____	_____	
Accessory Supra-orbital foramina	_____	_____	
Multiple Mental Foramina	_____	_____	
Mylo-hyoid Arch	_____	_____	
Accessory Infra-orbital foramina	_____	_____	
Tympanic Dihiscence	_____	_____	
Auditory Exostoses	_____	_____	
Divided Hypoglossal Canal	_____	_____	
Post-Condylar Canal <u>not</u> Patent	_____	_____	
Foramen Ovale incomplete	_____	_____	
Foramen spinosum open to F. lacerum	_____	_____	
Multiple Zygomatico- facial foramina	_____	_____	
Pterygo-alar spurs	_____	_____	
Pterygo-spinous spurs	_____	_____	


 Site: _____ Burial No. _____ Cat. No. _____

<u>Trait</u>	<u>Right</u>	<u>Left</u>	<u>Medial</u>
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Metopic Suture open			_____
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Bregmatic Bone			_____
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Inca Bone			_____
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Apical Bone			_____
-------------	--	--	-------

Os sagittal Suture			_____
--------------------	--	--	-------

Superior Sagittal Sulcus turns right			_____
---	--	--	-------

Mandibular Torus	_____	_____	
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Palatine Torus			_____
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Obelionic foramina	_____	_____	
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POST-CRANIAL NON-METRIC VARIANTS



Atlas: Lateral Bridging	_____	_____
-------------------------	-------	-------

Atlas: Posterior Bridging	_____	_____
---------------------------	-------	-------

C3: Accessory Foramina	_____	_____
------------------------	-------	-------

C4: Accessory Foramina	_____	_____
------------------------	-------	-------

C5: Accessory Foramina	_____	_____
------------------------	-------	-------

C6: Accessory Foramina	_____	_____
------------------------	-------	-------

C7: Accessory Foramina	_____	_____
------------------------	-------	-------

Humerus: Septal Aperture	_____	_____
--------------------------	-------	-------

L5: Spondylolysis	_____	_____
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APPENDIX III

DATA TABLES

Table	AI	Photographic inventory of Cedar Grove Historic Cemetery.
	AII	Autopsy specimens from Cedar Grove Historic Cemetery.
	AIII	Dental casts from Cedar Grove Historic Cemetery.
	AIV	Skeletal inventory for Cedar Grove Historic Cemetery.
	AV	Cranial nonmetric traits from Cedar Grove Historic Cemetery.
	AVI	Postcranial nonmetric traits from Cedar Grove Historic Cemetery.
	AVII	Skeletal metric for Cedar Grove Historic Cemetery.
	AVIII	Caries prevalence for permanent dentition.
	AIX	Caries prevalence for deciduous dentition.
	AX	Permanent dental abscessing from observable alveolar bone.
	AXI	Deciduous dental abscessing from observable alveolar bone.
	AXII	Calculus scores for permanent dentition.
	AXIII	Calculus scores for deciduous dentition.
	AXIV	Cedar Grove Historic Cemetery mortuary components.
	AXV	Cedar Grove Historic Cemetery personal goods.
	AXIV	Cedar Grove Historic Cemetery miscellaneous, prehistoric, and organic remains.
	AXIIV	Molar attrition scores for permanent dentition.

TABLE AI

Photographic Inventory of Cedar Grove
Historic Cemetery

Burial 10

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832072 - Frontal view of skull
- 832073 - Lateral view of skull
- 832074 - Occlusal view of mandibular dentition
- 832075 - Occlusal view of maxillary dentition
- 832078 - Sacro-iliac surfaces of pelvis
- 832079 - Symphyseal surfaces of pubic (pelvis) elements
- 832080 - Differential clavicle lengths
- 832081 - Triangular shaped thoracic centrums

35 mm - (Osteology)

- 823430 - Triangular shaped thoracic centrums
- 823863 - Patellas

Polaroid - (Artifacts)

- 832076 - Coffin lid fastener
- 832077 - Coffin handle

35 mm - (Artifacts)

- 823716 - Bottle
- 823717 - Button
- 823718 - Coffin metal decoration

Field Excavation Photographs (35 mm):

- 823614 - Full length view of burial
- 823615 - Full length view of burial
- 823616 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832082 - Labial view of dental samples
- 832083 - Lingual view of dental samples
- 832084 - Lateral view of 5cm portion of left femur midshaft

Burial 14

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832085 - Occlusal view of mandibular dentition
- 832086 - Sacro-illiac surfaces of pelvis
- 832087 - Symphyseal surfaces of pubic (pelvis) elements

35 mm - (Osteology)

- 823772 - Tooth (molar)
- 823773 - Cranial frontal bone
- 823775 - Femurs

35 mm - (Artifacts)

- 823843 - Two fragments of copper or brass diamond tacks

Field Excavation Photographs (35 mm):

- 823108 - Cranium/thorax
- 823109 - Thorax - knees
- 823109A - Legs/tibias

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832088 - Labial view of dental samples
- 832089 - Lingual view of dental samples
- 832090 - Hyoid bone
- 832091 - Lateral view of 5cm portion of left femur midshaft

Burial 15

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832092 - Occlusal view of mandibular dentition
- 832093 - Sacro-illiac surfaces of pelvis
- 832094 - Left tibia/fibula swelling (pathology)

38 mm - (Osteology)

- 823777 - Periostitis (infection) on right distal radius
- 823778 - Periostitis on left tibia/fibula shaft
- 823779 - Schmorl's depression on superior thoracic/lumbar vertebrae
- 823780 - Schmorl's depression on inferior thoracic/lumbar vertebrae
- 823781 - Left metatarsal
- 823782 - Schmorl's depression in inferior lumbar vertebrae

TABLE AI cont.

823836 - Mandible
823837 - Femora

Polaroid - (Artifacts)

832095 - Coffin lid fastener
832096 - "At Rest" plate

35 mm - (Artifacts)

823859 - Metal button
823854 - Cufflink
823855 - Gold plated cufflinks
823856 - "At Rest" plate
823857 - Bone collar stud
823858 - Bone button

Field Excavation Photographs (35 mm):

823578 - Full length view of burial
823579 - Cranial/thorax area
823580 - Thorax area
823581 - Pelvic/femoral area
823582 - Tibias
823583 - Tibias

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832097 - Labial view of dental samples
832098 - Lingual view of dental samples
832099 - Lateral view of 5cm portion of left femur midshaft
832100 - Carpal/wrist bones

Burial 16

Field Laboratory Photographs:

Polaroid - (Osteology)

832101 - Occlusal view of mandibular dentition
832102 - Occlusal view of maxillary dentition

Field Excavation Photographs (35 mm):

823109B - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832103 - Labial view of dental samples
832104 - Lingual view of dental samples

Burial 17

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832105 - Occlusal view of maxillary dentition
- 832106 - Occlusal view of mandibular dentition
- 832107 - Sphenoid bone

35 mm - (Artifacts)

- 823709 - Shoe heel

Field Excavation Photographs (35 mm):

- 823584 - Full length view of burial
- 823585 - Cranial/thorax area
- 823586 - Pelvic/femoral area

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832108 - Labial view of dental samples
- 832109 - Lingual view of dental samples

Burial 18

Field Excavation Photographs (35 mm):

- 823652 - Full length view of burial
- 823653 - Cranial to mid-femur
- 823654 - Thorax to feet

Burial 19

Field Excavation Photographs (35 mm):

- 823398 - Thorax to femur
- 823399 - Pelvic region
- 823400 - Femurs
- 823401 - Feet
- 823395 - Full length view of burial
- 823396 - Skull
- 823397 - Thorax

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832110 - Labial view of dental samples
- 832111 - Lingual view of dental samples
- 832112 - Lateral view of 5cm portion of left femur midshaft

Burial 21

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832113 - Frontal view of skull
- 832114 - Lateral view of skull
- 832115 - Occlusal view of mandibular dentition
- 832116 - Occlusal view of maxillary dentition
- 832117 - Sacro-illiac surfaces of pelvis
- 832118 - Symphyseal surfaces of pubic (pelvis) elements
- 832119 - Perforation on right dorsal pubic element
- 832120 - Anterior view of arthritic knee
- 832121 - Posterior view of arthritic knee
- 832122 - Posterior view of arthritic patella
- 832123 - Anterior view of pathologic condition of vertebral column
- 832124 - Anterior view of pathologic condition of vertebral column
- 832125 - Anterior view of pathologic condition of vertebral column

35 mm - (Osteology)

- 823860 - Ossified caratilage on 1st rib
- 823861 - Three distal phalanges with arthritic involvement
- 823862 - Right and left 1st metacarapal with arthritic involvement
- 823853 - Anterior view of arthritic knee

35 mm - (Artifacts)

- 823425 - White plastic button
- 823426 - Metal snap with fabric cover
- 823427 - Brass safety pin

Field Excavation Photographs (35 mm):

- 823594 - Full length view of burial
- 823595 - Full length view of burial
- 823596 - Legs
- 823597 - Middle 1/3 of burial
- 823598 - Upper 2/3 of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832126 - Labial view of dental samples
- 832127 - Lingual view of dental samples
- 832128 - Lateral view of 5cm portion of left femur midshaft
- 832129 - Sesamoid bones and hyoid bone

Burial 24

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832130 - Occlusal view of mandibular dentition
- 832131 - Sacro-illiac surfaces of pelvis
- 832132 - Occlusal view of maxillary dentition
- 832133 - Symphyseal surface of right pubic (pelvis) element
- 832134 - Metopic suture on cranium (frontal bone)
- 832135 - Cribra orbitalia on cranium (frontal bone)
- 832136 - Inca bone on cranium (occipital bone)
- 832137 - Pathologic left femur (proximal shaft end)
- 832138 - Cranial thickness of occipital bone
- 832139 - Cranial thickness of parietal bone
- 832140 - Symphyseal surface of left pubic (pelvis) element

35 mm - (Osteology)

- 823864 - Femurs
- 823865 - Femurs
- 823866 - Pathologic left femur (proximal shaft end)
- 823402 - Metopic suture on cranium (frontal bone)
- 823403 - Cribra orbitalia on cranium (frontal bone)
- 823404 - Cranial thickness of frontal bone
- 823405 - Cranial thickness of parietal bone
- 823406 - Periostitis (infection) on proximal tibial shafts

Polaroid - (Artifacts)

- 832141 - Coffin handle

35 mm - (Artifacts)

- 823742 - Cufflink
- 823743 - Coffin lid fastener
- 823433 - Coffin handle
- 823434 - Hinge
- 823435 - Coffin lid fastener

Field Excavation Photographs (35 mm):

- 823606 - Full length view
- 823607 - Close up of head
- 823608 - Close up midsection
- 823608 - Close up feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832142 - Labial view of dental samples
- 832143 - Lingual view of dental samples
- 832144 - Dorsal view of pathologic left femur (15 cm)

Burial 25

Field Excavation Photographs (35 mm):

823613 - Full length view of multiple burial

Burial 29

Field Laboratory Photographs:

Polaroid - (Osteology)

832147 - Occlusal view of mandibular dentition

832148 - Sacro-illiac surfaces of pelvis

35 mm - (Artifacts)

823564 - Sacro-illiac surfaces of pelvis

823774 - Femurs

Polaroid - (Artifacts)

832145 - Coffin lid fastener

832146 - Coffin handle

35 mm - (Artifacts)

823844 - Cast iron thumbscrew and white metal coffin lid fastener

823845 - Button

823846 - "At Rest" plate

823847 - Safety pin head

823848 - Coffin handle

823849 - Jet (?)

823850 - Fabric

823851 - Fabric near hand

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832149 - Labial view of dental samples

832150 - Lingual view of dental samples

832151 - Lateral view of 5cm portion of left femur midshaft

Field Excavation Photographs (35 mm):

823106 - Full length view of burial

823107 - Pelvis

Burial 31

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832153 - Frontal view of skull
- 832154 - Lateral view of skull
- 832155 - Occlusal view of mandibular dentition
- 832156 - Occlusal view of maxillary dentition
- 832157 - Sacro-illiac surfaces of pelvis
- 832158 - Right calcaneal (heel bone) nodule
- 832159 - Left distal tibial/fibular swelling

35 mm - (Osteology)

- 823560 - Femurs
- 823561 - Left tibial/fibular swelling

Polaroid - (Artifacts)

- 832152 - Coffin lid fastener

35 mm - (Artifacts)

- 823841 - Coffin ornaments
- 823842 - Unidentified iron object

Field Excavation Photographs (35 mm):

- 823104 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832160 - Labial view of dental samples
- 832161 - Lingual view of dental samples
- 832162 - Lateral view of 5cm portion of left femur midshaft

Burial 33

Field Laboratory Photographs:

35 mm - (Artifacts)

- 823753 - Coin
- 823754 - Comb
- 823429 - Coin

Field Excavation Photographs (35 mm):

- 823100 - Full length view of burial
- 823101 - Full length view of burial

Burial 34

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832163 - Cribra orbitalia on cranium (frontal bone)
- 832164 - Tibial periostitis (infection)
- 832165 - Periostitis on basilar (occipital) cranial bone
- 832166 - Comparative periosteal reactions to Burial 16

35 mm - (Osteology)

- 823562 - Cribra orbitalia on cranium (frontal bone)
- 823563 - Periostitis on body parts

Field Excavation Photographs (35 mm):

- 823099 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832167 - Labial view of dental samples
- 832168 - Lingual view of dental samples

Burial 35

Field Excavation Photographs (35 mm):

- 823603 - Full length view of burial
- 823604 - Full length view of burial
- 823605 - Full length view of burial

Burial 36

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832169 - Periostitis (infection) on various skeletal elements
- 832170 - Periostitis on scapula, clavicles and cranial fragments

Field Excavation Photographs (35 mm):

- 823617 - Full length view of burial
- 823618 - Full length view of burial
- 823619 - Full length view of burial

Burial 37

Field Laboratory Photographs:

35 mm - (Osteology)

823762 - Cribra orbitalia on cranium (frontal bone)

Field Excavation Photographs (35 mm):

823625 - Full length view of burial

823626 - Full length view of burial

823627 - Full length view of burial

Burial 38

Field Excavation Photographs (35 mm):

823610 - Full length view of burial

823611-- Full length view of burial

823612 - Full length view of burial

Burial 39

Field Laboratory Photographs:

Polaroid - (Osteology)

832172 - Occlusal view of mandibular dentition

832173 - Denture plate in maxilla (occlusal view)

832174 - Occlusal view of maxillary dentition

832175 - Denture plate (occlusal view)

832176 - Left humeral fracture (healed)

832177 - Left humeral fracture (healed)

832178 - Denture plate (frontal view)

35 mm - (Osteology)

823416 - Denture plate (frontal view)

823417 - Superior view of denture plate/palatal surface

823418 - Inferior view of denture plate/lingual surface

823421 - Occlusal view of maxilla with denture plate

823411 - Left humeral fracture (healed)

832412 - Right radius/ulna fracture (healed)

Polaroid - (Artifacts)

832171 - Two-piece coffin ornament

35 mm - (Artifacts)

823408 - Beads

823409 - Beads

823410 - Beads

TABLE AI cont.

823413 - Ring
823414 - Button
823415 - Comb

Field Excavation photographs (35 mm):

823642 - Glass plate over skull
823643 - Comb in hair
823644 - Full length view of burial
823645 - Cranium/thorax area
823646 - Thorax area
823647 - Knees
823648 - Feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832179 - Labial view of denture samples
832180 - Lingual view of denture samples
832181 - Lateral view of 5cm femur midshaft

Burial 40

Field Laboratory Photographs:

Polaroid - (Osteology)

832182 - Occlusal view of mandibular dentition
832183 - Occlusal view of maxillary dentition
832814 - Cribra orbitalia on cranium (frontal) bone

35 mm - (Osteology)

823758 - Cribra orbitalia on cranium (frontal) bone

Field Excavation Photographs (35 mm):

823628 - Full length view of burial
823629 - Cranium/thorax area
823630 - 90° view of body
823631 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832185 - Labial view of dental samples
832186 - Lingual view of dental samples

Burial 41

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832188 - Frontal view of skull
- 832189 - Lateral view of skull
- 832190 - Occlusal view of mandibular dentition

Polaroid - (Artifacts)

- 832187 - "At Rest" plate

35 mm - (Artifacts)

- 823705 - "At Rest" plate
- 823706 - Gold plated earring
- 823707 - Two metal buttons covered with fabric
- 823708 - Silver ring

Field Excavation Photographs (35 mm):

- 823938 - Full length view of burial
- 823939 - Cranium/thorax area
- 823940 - Pelvis
- 823941 - Legs/femurs
- 823942 - Legs/femurs

Burial 42

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832193 - Frontal view of skull
- 832194 - Lateral view of skull
- 832195 - Occlusal view of mandibular dentition

Polaroid - (Artifacts)

- 832191 - "At Rest" plate
- 832192 - Coffin lid fastener

35 mm - (Artifacts)

- 823714 - "At Rest" plate
- 823720 - Ring
- 823760 - Hinge

Field Excavation Photographs (35 mm):

- 832955 - Full length view of burial
- 832956 - Full length view of burial
- 832957 - Cranium, neck, chest area
- 832958 - Thorax, pelvic area
- 832959 - Legs/femurs
- 832960 - Legs/tibias

Burial 43

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832196 - Pathologic lesions on cerebral surface of frontal (cranial) bone
- 832197 - Periostitis (infection) on left tibia
- 832198 - Periostitis on left fibula
- 832199 - Right ulna fracture (healed)

35 mm - (Osteology)

- 823712 - Pathologic lesions on cerebral surface of frontal (cranial) bone
- 823713 - Right ulna fracture (healed)

35 mm - (Artifacts)

- 823723 - Comb
- 823724 - Earrings
- 823725 - Perforated coin
- 823726 - Beads

Field Excavation Photographs (35 mm):

- 823920 - Full length view of burial
- 823921 - Full length view of burial
- 823922 - Cranium/thorax
- 823923 - Thorax
- 823924 - Pelvis
- 823925 - Legs/femurs, knees
- 823926 - Legs/tibias, feet

Burial 44

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832200 - Frontal view of skull
- 832201 - Lateral view of skull

35 mm - (Artifacts)

- 823733 - Buckle
- 823734 - Coin

Field Excavation Photographs (35 mm):

- 823701 - Full length view of burial
- 823702 - Cranium/thorax
- 823703 - Thorax
- 823704 - Pelvis/femurs
- 823969 - Knees
- 823970 - Tibias/feet
- 823971 - Tibias/feet

Burial 45

Field Laboratory Photographs:

35 mm - (Osteology)

- 823487 - Periostitis (infection) on parietal (cranial) bones
- 823488 - Periostitis on frontal bones
- 823489 - Periostitis on spinous (scapulae) processes
- 823490 - Periostitis on right and left tibia/fibulae
- 823491 - Periostitis on femora
- 823492 - Periostitis on pelvic elements
- 823493 - Periostitis on right and left humeri
- 823494 - Periostitis on right and left humeri
- 823495 - Periostitis on right and left scapulae
- 823496 - Periostitis on occipital (cranial) bone

Field Excavation Photographs (35 mm):

- 823972 - Full length view of burial

Burial 47

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832202 - Occlusal view of mandibular dentition
- 832203 - Occlusal view of maxillary dentition

Polaroid - (Artifacts)

- 832204 - Coffin handle

35 mm - (Osteology)

- 823505 - Pathologic lesion on frontal (cranial) bone

35 mm - (Artifacts)

- 823474 - Shoe heel
- 823475 - Coin

Field Excavation Photographs (35 mm):

- 823814 - Full length view of burial
- 823815 - Cranium/chest
- 823816 - Thorax
- 823817 - Thorax
- 823818 - Pelvis
- 823819 - Legs/femurs
- 823820 - Legs/tibias

Osteology Laboratory Photographs:

Polaroid - (Autopsy Specimens)

- 832205 - Labial view of dental samples
- 832206 - Lingual view of dental samples
- 832207 - Lateral view of 5cm portion of left femur midshaft

Burial 48

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832208 - Occlusal view of mandibular dentition
- 832209 - Occlusal view of maxillary dentition

Field Excavation Photographs (35 mm):

- 823809 - Full length view of burial
- 823810 - Cranium/thorax
- 823811 - Disarticulated thorax
- 823812 - Femurs
- 823813 - Feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832210 - Labial view of dental samples
- 832211 - Lingual view of dental samples
- 832212 - Lateral view of 5cm portion of left femur midshaft

Burial 49

Field Laboratory Photographs:

35 mm - (Osteology)

823504 - Pathologic lesions on cerebral surface of frontal (cranial) bone

Field Excavation Photographs (35 mm):

823881A- Full view of burial

823881B- Cranium/neck area

Burial 50

Field Laboratory Photographs:

35 mm - (Artifacts)

823518 - Leather

Field Excavation Photographs (35 mm):

823821 - Full length view of burial

823822 - Upper 3/4 view of burial

823823 - Lower 3/4 view of burial

Burial 52

Field Laboratory Photographs:

35 mm - (Artifacts)

823519 - Safety pin head

Field Excavation Photographs (35 mm):

823831 - Full length view of burial

823832 - Cranium/thorax

823833 - Lower 3/4 of burial

823834 - Lower 3/4 of burial

Burial 54

Field Laboratory Photographs:

35 mm - (Osteology)

823516 - Frontal view of mandible

823517 - Frontal view of right maxilla

35 mm - (Artifacts)

- 823523 - Screw
- 823524 - Fabric/leather

Field Excavation Photographs (35 mm):

- 823660 - Full length view of burial
- 823661 - Cranium/neck
- 823662 - Thorax
- 823663 - Pelvis/legs
- 823664 - Legs

Osteology Laboratory Photographs:

Polaroid - (Autopsy Specimens):

- 832213 - Labial view of dental samples
- 832214 - Lingual view of dental samples

Burial 55

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832215 - Frontal view of skull
- 832216 - Lateral view of skull
- 832217 - Occlusal view of mandibular dentition
- 832218 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823532 - Right misguided canine in chin
- 823533 - Occlusal view of right misguided canine

35 mm - (Artifacts)

- 823528 - Lead bullet slug

Field Excavation Photographs (35 mm):

- 823805 - Full length view of burial
- 823806 - Cranium/thorax
- 823807 - Thorax
- 823808 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832219 - Labial view of dental samples
- 832220 - Lingual view of dental samples
- 832221 - Lateral view of 5cm portion of left femur midshaft

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CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY

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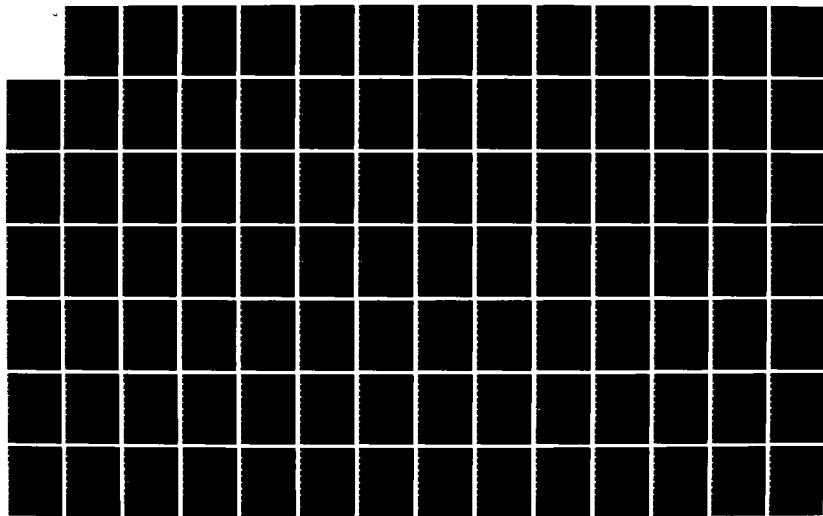
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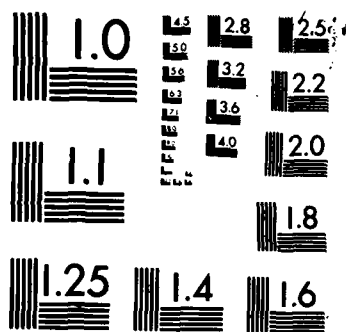
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MICROCOPY RESOLUTION TEST CHART
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Burial 56

Field Laboratory Photographs: 35 mm (Osteology)

- 823511 - Periostitis (infection) on occipital (cranial) bone
- 823512 - Periostitis on cerebral surface of frontal (cranial) bone
- 823513 - Periostitis on parietal (cranial) bone
- 823514 - Periostitis on parietal fragments
- 823515 - Periostitis on parietal fragments

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832222 - Labial view of dental samples
- 832223 - Lingual view of dental samples

Field Excavation Photographs (35 mm):

- 823655 - Full length view of burial
- 823656 - Cranium/chest
- 823657 - Thorax
- 823658 - Thorax/femurs
- 823659 - Legs/femurs, tibias

Burial 57

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832224 - Occlusal view of mandibular dentition
- 832225 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823500 - Periostitis (infection) on proximal ulnar shafts

35 mm - (Artifacts)

- 823482 - Shell button

Field Excavation Photographs (35 mm:)

- 823390 - Full length view of burial
- 823391 - Cranium/chest
- 823392 - Thorax
- 823393 - Pelvis/femurs
- 823394 - Legs/femurs, tibias

Burial 58

Field Laboratory Photographs:

35 mm - (Osteology)

823501 - Cribra orbitalia on frontal (cranial) bone

Field Excavation Photographs (35 mm):

823877 - Full length view of burial

823878 - Cranium/thorax

823879 - Thorax

823880 - Legs

Burial 59

Field Laboratory Photographs:

35 mm - (Osteology)

823508 - Tibias

823509 - Femurs

823510 - Cribra orbitalia on frontal (cranial) bone

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832229 - Labial view of dental samples

832230 - Lingual view of dental samples

Burial 60

Field Laboratory Photographs:

35 mm - (Osteology)

823506 - Cribra orbitalia on frontal (cranial) bones

823507 - Periostitis (infection) on cranial bones

Burial 61

Field Laboratory Photographs:

Polaroid - (Osteology)

832231 - Frontal view of skull

832232 - Lateral view of skull

832233 - Occlusal view of mandibular dentition

35 mm - (Osteology)

- 823480 - Button osteoma on frontal (cranial) bone
- 823481 - Button osteoma on frontal (cranial) bone
- 823486 - Osteophytosis of sacral promontory and the 5th lumbar vertebra

Field Excavation Photographs (35 mm):

- 823974 - Full length view of burial
- 823975 - Cranium/thorax
- 823976 - Disarticulated thorax
- 823977 - Pelvis
- 823978 - Knees
- 823979 - Feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832234 -- Labial view of dental samples
- 832235 - Lingual view of dental samples
- 832236 - Lateral view of 5cm portion of left femur midshaft

Burial 65

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832237 - Frontal view of skull
- 832238 - Lateral view of skull
- 832239 - Occlusal view of mandibular dentition
- 832240 - Occlusal view of maxillary dentition
- 832241 - Bregmatic (cranial) bone

35 mm - (Artifacts)

- 823715 - Comb

Field Excavation Photographs (35 mm):

- 823908 - Full length view of burial
- 823909 - Cranium/thorax
- 823910 - Pelvis
- 823911 - Legs
- 823912 - Lower legs
- 823966 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832242 - Labial view of dental samples
- 832243 - Lingual view of dental samples
- 832244 - Lateral view of 5cm portion of left femur midshaft

Burial 66

Field Laboratory Photographs:

Polaroid - (Osteology)

832245 - Occlusal view of mandibular dentition

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832246 - Lateral view of 5cm portion of left femur midshaft

Field Excavation Photographs (35 mm):

823943 - Full length view of burial

823944 - Close up cranium

923945 - Close up thorax

823946 - Close up legs

823947 - Close up feet

Burial 67

Field Laboratory Photographs:

Polaroid - (Osteology)

832250 - Frontal view of skull

832251 - Lateral view of skull

832252 - Occlusal view of mandibular dentition

832253 - Occlusal view of maxillary dentition

832254 - Sacro-iliac surfaces of pelvis

35 mm - (Osteology)

823407 - Femurs

Polaroid - (Artifacts)

832247 - "At Rest" plate

832248 - Two-piece coffin ornament

832249 - Coffin lid fastener

35 mm - (Artifacts)

823431 - Cast iron coffin screw

823432 - Cast iron thumb screw

Field Excavation Photographs (35 mm):

- 823632 - Full length view of burial
- 823633 - Full length view of burial
- 823634 - Cranium/thorax
- 823635 - Thorax
- 823636 - Femurs
- 823637 - Lower legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832255 - Labial view of dental samples
- 832256 - Lingual view of dental samples
- 832257 - Lateral view of 5cm portion of left femur midshaft

Burial 68

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832259 - Frontal view of skull
- 832260 - Lateral view of skull
- 832261 - Occlusal view of mandibular dentition
- 832262 - Occlusal view of maxillary dentition
- 832263 - Right femur (amputation)
- 832264 - Right femur amputation (saw grooves on bone)
- 832265 - Humeral deltoid tuberosities
- 832266 - Clavicular assymetry

35 mm - (Osteology)

- 823751 - Right femur (amputation)

Polaroid - (Artifacts)

- 832258 - Coffin handle

35 mm - (Artifacts)

- 823744 - Button of white synthetic material
- 823745 - Metal flask
- 823746 - Egg shell

Field Excavation Photographs (35 mm):

- 823620 - Full length view of burial
- 823621 - Cranium/thorax
- 823622 - Thorax
- 823623 - Amputated right femur
- 823624 - Lower legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832267 - Labial view of dental samples
- 832268 - Lingual view of dental samples
- 832269 - Lateral view of 5cm portion of left femur midshaft

Burial 69

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832270 - Occlusal view of mandibular dentition
- 832271 - Occlusal view of maxillary dentition
- 832272 - Right lateral view of mandible
- 832273 - Periostitis (infection) on cerebral surface of occipital (cranial) bone
- 832274 - Femurs

35 mm - (Osteology)

- 823852 - Femurs

Field Excavation Photographs (35 mm):

- 823587 - Full length view of burial
- 823588 - Upper 3/4 length of burial
- 823589 - Lower 3/4 length of burial

Burial 70

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832276 - Frontal view of skull
- 832277 - Lateral view of skull
- 832278 - Occlusal view of mandibular dentition
- 832279 - Occlusal view of maxillary dentition
- 832280 - Ossified xyphoid (sternum) process
- 832281 - Sacro-iliac surfaces of pelvis
- 832282 - Fronto-lateral view of lumbar vertebrae
- 832283 - Dorsal view of lumbar vertebrae exhibiting degenerative articulating processes
- 832284 - Schmorl's nodes on superior thoracic vertebrae

35 mm - (Osteology)

- 823553 - Femurs
- 823554 - Femurs
- 823555 - Symphyseal surfaces of pubic (pelvis) elements
- 823556 - Symphyseal surfaces of pubic (pelvis) elements

TABLE AI cont.

- 823557 - Symphyseal surfaces of pubic (pelvis) elements
- 823558 - Sacro-iliac surfaces of pelvis
- 823559 - Sacro-iliac surfaces of pelvis

Polaroid - (Artifacts)

- 832275 - Coffin lid fastener

35 mm - (Artifacts)

- 823568 - Whiteware saucer
- 823569 - Whiteware saucer
- 823570 - Buttons
- 823571 - "At Rest" plate
- 823572 - Diamond-shaped tack
- 823573 - Coffin handle
- 823755 - Liberty nickel (1897)

Field Excavation Photographs (35 mm):

- 823087 - Burial pit outline
- 823088 - Skull
- 823089 - Skull
- 823091 - Full length view of burial
- 823092 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832285 - Labial view of dental samples
- 832286 - Lingual view of dental samples
- 832287 - Lateral view of 5cm portion of left femur midshaft
- 832288 - Ossified costal cartilage
- 832289 - Ossified thyroid cartilage

Burial 77

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832292 - Occlusal view of mandibular dentition
- 832293 - Occlusal view of maxillary dentition
- 832294 - Supernumary (extra) tooth in maxillary dentition
- 832295 - Schmorl's depressions on superior thoracic vertebral bodies
- 832296 - Sacro-iliac surfaces of pelvis
- 832297 - Anterior inferior iliac crest (pelvis) porosity
- 832298 - Periostitis (infection) on clavicles
- 832299 - Periostitis on both scapulae
- 832300 - Periostitis on femur shafts
- 832301 - Periostitis on right and left tibia shafts
- 832302 - Periostitis on left radius/ulna shafts
- 832303 - Periostitis on right radius/ulna shafts
- 832304 - Periostitis on fibular shafts

TABLE AI cont.

35 mm - (Osteology)

823552 - Femurs

Polaroid - (Artifacts)

832290 - Coffin lid fastener

832291 - Coffin lid fragment with brass ornamentation

35 mm - (Artifacts)

823763 - Coffin handle

823747 - Fabric

823748 - Cufflink

823574 - White plastic cufflinks or shirt studs

823575 - Three shell buttons

823576 - Coffin lid fastener

823577 - Coffin wood with red and white paint

Field Excavation Photographs (35 mm):

823090 - Lower half view of burial

823549 - Burial pit

823550 - Upper 3/4 view of burial

823551 - Lower 3/4 view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832305 - Labial view of dental samples

832306 - Lingual view of dental samples

832307 - Lateral view of 5cm portion of left femur midshaft

Burial 78

Field Laboratory Photographs:

Polaroid - (Artifacts)

832308 - Coffin handle

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832309 - Labial view of dental samples

832310 - Lingual view of dental samples

832311 - Lateral view of 5cm portion of left femur midshaft

Burial 79

Field Laboratory Photographs:

35 mm - (Artifacts)

- 823749 - "Mother" plate
- 823750 - "Mother" plate
- 823752 - Coffin ornament

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832312 - Labial view of dental samples
- 832313 - Lingual view of dental samples

Burial 80

Field Excavation Photographs (35 mm):

- 823590 - Full length view of burial
- 823591 - Upper 3/4 view of burial
- 823592 - Lower 3/4 view of burial

Burial 81

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832314 - Occlusal view of mandibular dentition
- 832315 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823761 - Arthritic involvement of left elbow (humerus, radius, ulna)

35 mm - (Artifacts)

- 823419 - Gold plated earring
- 823420 - Shoe heel
- 823422 - Comb

Field Excavation Photographs (35 mm):

- 823649 - Full length view of body
- 823650 - Cranium/thorax
- 823651 - Thorax

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832316 - Labial view of dental samples
- 832317 - Lingual view of dental samples
- 832318 - Lateral view of 5cm portion of left femur midshaft

Burial 82

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832319 - Frontal view of skull
- 832320 - Lateral view of skull
- 832321 - Occlusal view of mandibular dentition
- 832322 - Occlusal view of maxillary dentition
- 832323 - Symphyseal surface of pubic (pelvis) elements
- 832324 - Sacral curvature

35 mm - (Artifacts)

- 823756 - Buckle

Field Excavation Photographs (35 mm):

- 823948 - Full length view of burial
- 823949 - Cranium/thorax
- 823950 - Thorax
- 823951 - Pelvis
- 823952 - Femurs
- 823953 - Tibias

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832325 - Labial view of dental samples
- 832326 - Lingual view of dental samples
- 832327 - Lateral view of 5cm portion of left femur midshaft

Burial 83

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832328 - Occlusal view of mandibular dentition
- 832329 - Occlusal view of maxillary dentition
- 832330 - Frontal view of maxillary dentition

35 mm - (Osteology)

823497 - Frontal view of maxillary dentition

Field Excavation Photographs (35 mm):

823913 - Full length view of burial
823914 - Full length view of burial
823915 - Cranium/neck
823916 - Thorax
823917 - Pelvis
823918 - Legs
823919 - Knees/feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832331 - Labial view of dental samples
832332 - Lingual view of dental samples
832333 - Lateral view of 5cm portion of left femur midshaft

Burial 84

Field Excavation Photographs (35 mm):

823927 - Full length view of burial
823928 - Cranium/thorax
823929 - Thorax
823930 - Pelvis

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832334 - Labial view of dental samples
832335 - Lingual view of dental samples
832336 - Lateral view of 5cm portion of left femur midshaft

Burial 85

Field Laboratory Photographs:

35 mm - (Artifacts)

823732 - Screw

Field Excavation Photographs (35 mm):

823697 - Full length view of burial
823698 - Cranial area
823699 - Thorax area
823700 - Knee area

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832337 - Labial view of dental samples
- 832338 - Lingual view of dental samples

Burial 86

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832339 - Frontal view of skull
- 832340 - Lateral view of skull
- 832341 - Occlusal view of mandibular dentition
- 832342 - Occlusal view of maxillary dentition

Field Excavation-Photographs (35 mm):

- 823898 - Full length view of burial
- 823899 - Cranium/neck
- 823900 - Cranium/neck
- 823901 - Cranium/neck
- 823902 - Thorax
- 823903 - Pelvis/femurs
- 823904 - Tibias/feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832343 - Labial view of dental samples
- 832344 - Lingual view of dental samples
- 832345 - Lateral view of 5cm portion of left femur midshaft

Burial 87

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832346 - Frontal view of skull
- 832347 - Lateral view of skull
- 832348 - Occlusal view of mandibular dentition
- 832349 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823525 - Button osteoma on frontal (cranial) bone
- 823531 - Schmorl's nodes on inferior centrams of thoracic/lumbar vertebrae

Field Excavation Photographs (35 mm):

- 823665 - Thorax
- 823666 - Pelvis
- 823667 - Femurs
- 823668 - Feet
- 823689 - Full length view of burial
- 823690 - Cranium/neck

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832350 - Labial view of dental samples
- 832351 - Lingual view of dental samples
- 832352 - Lateral view of 5cm portion of left femur midshaft

Burial 88

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832353 - Occlusal view of mandibular dentition
- 832354 - Occlusal view of maxillary dentition

35 mm - (Artifacts)

- 823529 - Buttons

Field Excavation Photographs (35 mm):

- 823801 - Full length view of burial
- 823802 - Cranium/thorax
- 823803 - Thorax
- 823804 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832355 - Labial view of dental samples
- 832356 - Lingual view of dental samples
- 832357 - Lateral view of 5cm portion of left femur midshaft

Burial 89

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832358 - Frontal view of skull
- 832359 - Lateral view of skull
- 832360 - Occlusal view of mandibular dentition
- 832361 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823484 - Dorsal view of thoracic vertebra with periosteal (infection) reaction on neural arch

Field Excavation Photographs (35 mm):

- 823882 - Full length view of burial
- 823883 - Full length view of burial
- 823884 - Cranium/neck
- 823885 - Disarticulated thorax
- 823886 - Thorax
- 823887 - Thorax
- 823887a- Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832362 - Labial view of dental samples
- 832363 - Lingual view of dental samples
- 832364 - Lateral view of 5cm portion of left femur midshaft

Burial 90

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832365 - Frontal view of skull
- 832366 - Lateral view of skull
- 832367 - Occlusal view of mandibular dentition

35 mm - (Osteology)

- 823485 - Double septal aperture in distal humerus
- 823478 - Left femur head fused into acetabulum
- 823479 - Left femur head fused into acetabulum
- 823483 - Fused metacarpals

35 mm - (Artifact)

- 823741 - Button

Field Excavation Photographs (35 mm):

- 823894 - Thorax
- 823895 - Pelvis
- 823896 - Legs/knees
- 823897 - Legs/feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens) ..

832368 - Lateral view of 5cm portion of left femur midshaft

Burial 92

Field Laboratory Photographs:

Polaroid - (Osteology)

832369 - Frontal view of skull

832370 - Lateral view of skull

832371 - Occlusal view of mandibular dentition

832372 - Occlusal view of maxillary dentition

35 mm - (Artifacts)

823719 - Cufflink

Field Excavation Photographs (35 mm):

823691 - Full length view of burial

823692 - Cranium/neck

823693 - Thorax

823694 - Pelvis

823695 - Femurs

823696 - Tibias/feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832373 - Labial view of dental samples

832374 - Lingual view of dental samples

832375 - Lateral view of 5cm portion of left femur midshaft

Burial 93

Field Laboratory Photographs:

Polaroid - (Osteology)

832377 - Frontal view of skull

832378 - Lateral view of skull

832379 - Occlusal view of mandibular dentition

832380 - Bullet fragment embedded in lumbar vertebrae

35 mm - (Osteology)

823710 - Bullet fragment embedded in lumbar vertebrae

823711 - Bullet fragment embedded in lumbar vertebrae

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832381 - Labial view of dental samples
- 832382 - Lingual view of dental samples
- 832383 - Lateral view of 5cm portion of left femur midshaft

Burial 94

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832385 - Frontal view of skull
- 832386 - Lateral view of skull
- 832387 - Occusal view of mandibular dentition
- 832388 - Occlusal view of maxillary dentition

35 mm - (Artifacts)

- 823729 - Metal ring
- 823730 - Comb
- 823731 - Gold 14k ring
- 823727 - Metal cone
- 823728 - Metal campaign ribbon?/award?

Field Excavation Photographs (35 mm):

- 823961 - Upper 3/4 of burial
- 823962 - Pelvis/legs
- 823963 - Pelvis/legs
- 823964 - Thorax/disarticulated
- 823965 - Cranium
- 823954 - Glass above cranium

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832389 - Labial view of dental samples
- 832390 - Lingual view of dental samples

Burial 95

Field Laboratory Photographs:

Polaroid - (Artifacts)

- 832391 - Coffin lid fastener
- 832392 - Two-piece coffin ornament

35 mm - (Artifacts)

- 823721 - Button
- 823722 - Gold earring with circular rhinestone

Field Excavation Photographs (35 mm):

- 823931 - Legs
- 823932 - Glass over head area
- 823933 - Full length view of burial
- 823934 - Cranium/thorax
- 823935 - Thorax
- 823936 - Legs
- 823937 - Pelvis

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832393 - Lateral view of 5cm portion of left femur midshaft

Burial 96

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832394 - Frontal view of skull
- 832395 - Lateral view of skull
- 832396 - Sacro-iliac surfaces of pelvis
- 832397 - Osteophytosis on lumbar, cervical and odontoid process of vertebrae
- 832398 - Periostitis (infection) on left tibia and fibula
- 832399 - Distal phalange of big toe with arthritic border
- 832400 - Right 5th metatarsal with arthritic border on head

35 mm - (Artifacts)

- 823423 - Bone button
- 823424 - White metal cufflink

Field Excavation Photographs (35 mm):

- 823593 - Thorax with glass plate on top
- 823599 - Full length view of burial
- 823600 - Cranium/thorax
- 823601 - Thorax with fabric
- 823602 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832401 - Labial view of dental samples
- 832402 - Lingual view of dental samples
- 832403 - Lateral view of 5cm portion of left femur midshaft
- 832404 - Ossified cartilage and sesamoids

Burial 97

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832406 - Sacro-iliac surfaces of pelvis
- 832407 - Symphyseal surfaces on pubic (pelvis) elements
- 832408 - Arthritic ulnar shaft
- 832409 - Arthritic metacarpal

35 mm - (Osteology)

- 823764 - Left fibular shaft swelling
- 823765 - Distal metatarsal arthritic involvement
- 823766 - 1st metatarsal distal end with arthritic involvement
- 823767 - Arthritic involvement on proximal ends of metacarpals
- 823768 - Left distal femoral shaft swelling (periostitis - infection)
- 823769 - Superior view of sacrum and lumbar vertebrae exhibiting marginal degeneration
- 823770 - Superior view of sacrum and lumbar vertebrae exhibiting marginal degeneration
- 823771 - Frontal view of sacrum and three lumbar vertebrae exhibiting osteophytosis
- 823776 - Femurs

Polaroid - (Artifacts)

- 832405 - Coffin lid fastener

35 mm - (Artifacts)

- 823839 - Button
- 823840 - Coffin handle

Field Excavation Photographs (35 mm):

- 823102 - Burial pit outline
- 823103 - Burial pit outline
- 823104 - Full length view of burial

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832410 - Lateral view of 5cm portion of left femur midshaft

Burial 100

Field Laboratory Photographs:

Polaroid - (Osteology)

832411 - Frontal view of skull

832412 - Lateral view of skull

832413 - Occlusal view of mandibular dentition

832414 - Occlusal view of mandibular dentition

35 mm - (Artifacts)

823736 -- Small glass beads

823737 - Large glass beads

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832415 - Labial view of dental samples

832416 - Lingual view of dental samples

Field Excavation Photographs (35 mm):

823905 - Full length view of burial

823906 - Close up head and shoulders

823907 - Close up midsection

Burial 101

Field Laboratory Photographs:

Polaroid - (Osteology)

832417 - Occlusal view of mandibular dentition

832418 - Occlusal view of maxillary dentition

35 mm - (Osteology)

823980 - Full length view of burial

823981 - Full length view of burial

823982 - Cranium/thorax

823983 - Thorax

823984 - Pelvis/femurs

823985 - Legs

35 mm - (Artifacts)

823735 - Coin

Field Excavation Photographs (35 mm):

823980 - Full length view of burial
823981 - Full length view of burial
823982 - Cranium/chest
823983 - Thorax
823984 - Pelvis/femurs
823985 - Legs/tibias

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832419 - Labial view of dental samples
832420 - Lingual view of dental samples
832421 - Lateral view of 5cm portion of left femur midshaft

Burial 102

Field Laboratory Photographs:

Polaroid - (Osteology)

832423 - Occlusal view of mandibular dentition
832424 - Frontal view of skull
832425 - Lateral view of skull

35 mm - (Osteology)

823498 - Fused thoracic vertebrae (frontal view)
823499 - Fused thoracic vertebrae (dorsal view)

Field Excavation Photographs (35 mm):

823888 - Full length view
823889 - Cranium/neck
823890 - Thorax
823891 - Pelvis
823892 - Disarticulated pelvis/femurs
823893 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832426 - Labial view of dental samples
832427 - Lingual view of dental samples
832428 - Lateral view of 5cm portion of left femur midshaft

Burial 103

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832429 - Frontal view of skull
- 832430 - Lateral view of skull
- 832431 - Occlusal view of mandibular dentition
- 832432 - Occlusal view of maxillary dentition

35 mm - (Osteology)

- 823502 - Dorsal view of L5 fused to sacrum
- 823503 - Anterior view of L5 fused to sacrum

35 mm - (Artifacts)

- 823476 - Shoe heel
- 823477 - Gold-plated earring

Field Excavation Photographs (35 mm):

- 823868 - Full length view of burial
- 823869 - Cranium/thorax
- 823870 - Thorax
- 823871 - Femurs
- 823872 - Femurs
- 823873 - Lower legs
- 823974 - Feet
- 823875 - Feet
- 823876 - Feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832433 - Labial view of dental samples
- 832434 - Lingual view of dental samples
- 832435 - Lateral view of 5cm portion of left femur midshaft

Burial 104

Field Laboratory Photographs:

Polaroid - (Artifacts)

- 832436 - Coffin handle (104A)
- 832437 - Coffin handle (104C)
- 832438 - Coffin lid fastener

35 mm - (Artifacts)

- 823520 - Coffin handle
- 823521 - Coffin handle
- 823522 - Plaster fragment with red paint

Field Excavation Photographs (35 mm):

- 823824 - Glass plate over burial
- 823825 - Full length view of burial
- 823826 - Cranium/thorax
- 823827 - Disarticulated thorax
- 823828 - Pelvis
- 823829 - Legs
- 823830 - Lower legs/feet

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832439 - Labial view of dental samples
- 832440 - Lingual view of dental samples

Burial 105

Field Excavation Photographs (35 mm):

- 823686 - Full length view of burial
- 823687 - Full length view of burial
- 823688 - Full length view of burial

Burial 106

Field Laboratory Photographs:

35 mm - (Osteology)

- 823548 - Clavicles

Field Excavation Photographs (35 mm):

- 823669 - Full length view of burial
- 823670 - Full length view of burial
- 823671 - Legs

Burial 107

Field Excavation Photographs (35 mm):

- 823683 - Full length view of burial
- 823684 - Upper 2/3 of burial
- 823685 - Lower 2/3 of burial

Burial 108

Field Laboratory Photographs:

35 mm - (Artifacts)

- 823526 - Safety pin
- 823537 - Two seeds or beads

Field Excavation Photographs (35 mm):

- 823797 - Full length view of burial
- 823798 - Upper 2/3 of burial
- 823799 - Legs
- 823800 - Pelvis

Burial 109

Field Excavation Photographs (35 mm):

- 823671 - Full length view of burial
- 823672 - Full length view of burial
- 823673 - Full length view of burial
- 823674 - Full length view of burial

Burial 110

Field Laboratory Photographs:

35 mm - (Osteology)

- 823543 - Periostitis (infection) on cerebral surface of frontal (cranial) bone
- 823544 - Periostitis on femurs
- 823545 - Periostitis on femurs
- 823546 - Periostitis on tibias
- 823547 - Periostitis on pelvis

35 mm - (Artifact)

- 823530 - Safety pin

Field Excavation Photographs (35 mm):

- 823675 - Full length view of burial
- 823676 - Upper 2/3 of burial
- 823677 - Lower 2/3 of burial

Burial 111

Field Laboratory Photographs:

35 mm - (Osteology)

- 823534 - Periostitis (infection) on temporal (cranial) bone
- 823535 - Periostitis on sphenoid (cranial) bone
- 823536 - Periostitis on basilar portion of occipital (cranial) bone
- 823537 - Periostitis on frontal (cranial) bone
- 823538 - Periostitis on parietal (cranial) bone
- 823539 - Periostitis on cerebral area of frontal (cranial) bone
- 823540 - Periostitis on occipital (cranial) bone
- 823541 - Periostitis on parietal (cranial) bone
- 823542 - Periostitis on parietal (cranial) bone

Field Excavation Photographs (35 mm):

- 825678 - Upper 2/3 of burial
- 823679 - Upper 2/3 of burial
- 823680 - Middle 1/3 of burial
- 823681 - Middle 1/3 of burial
- 823682 - Lower 2/3 of burial

Burial 112

Field Laboratory Photographs:

35 mm - (Osteology)

- 823838 - Skeletal elements with periostitis (infection)

Field Excavation Photographs (35 mm):

- 823096 - Cranium
- 823097 - Thorax
- 823098 - Thorax

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

- 832441 - Labial view of dental samples
- 832442 - Lingual view of dental samples

Burial 114

Field Laboratory Photographs:

Polaroid - (Osteology)

- 832443 - Occlusal view of mandibular dentition
- 832444 - Occlusal view of maxillary dentition
- 832445 - Frontal view of mandible
- 832446 - Frontal view of maxilla

35 mm - (Osteology)

823759 - Cribra orbitalia on frontal (cranial) bone

Field Excavation Photographs (35 mm):

823638 - Full length view of burial
823639 - Cranium/thorax
823640 - Thorax
823641 - Legs

Osteology Laboratory (University of Arkansas) Photographs:

Polaroid - (Autopsy Specimens)

832447 - Labial view of dental samples
832448 - Lingual view of dental samples

Miscellaneous photographs of field excavation, waterscreening, washing station and skeletal analysis laboratory.

823436 - Washing station procedures
823437 - Washing station procedures
823438 - Washing station procedures
823439 - Field osteology laboratory procedures
823440 - Field osteology laboratory procedures
823441 - Field osteology laboratory procedures
823442 - Field osteology laboratory procedures
823443 - Field osteology laboratory procedures
823444 - Field osteology laboratory procedures
823445 - Field osteology laboratory procedures
823446 - Washing station procedures
823447 - Waterscreening station
823448 - Field excavation procedures
823449 - Field excavation procedures
823450 - Field excavation procedures
823451 - Field excavation procedures
823452 - Field excavation procedures
823453 - Field excavation procedures
823454 - Field excavation procedures
823455 - Field excavation procedures
823456 - Field excavation procedures
823457 - Field excavation procedures
823458 - Field excavation procedures
823459 - Field excavation procedures
823460 - Field excavation procedures
823461 - Field excavation procedures
823462 - Waterscreening procedure
823463 - Waterscreening procedure
823464 - Field excavation procedures
823465 - Field excavation procedures
823466 - Field osteology and photography laboratories
823467 - Field excavation techniques
823468 - Field excavation techniques

TABLE AI cont.

823469 - Field excavation techniques
823470 - Field excavation techniques
823471 - Field excavation techniques
823472 - Field excavation techniques
823473 - Field excavation techniques
823672 - Field excavation techniques
823867 - Field excavation techniques
823967 - Field excavation techniques
823968 - Field excavation techniques

TABLE AII

Autopsy Specimens from Cedar Grove Historic
Cemetery

Burial 10

Maxillary right frontal incisor (8)¹
Mandibular right canine (27)
Five centimeter section from left femur midshaft

Burial 14

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Hyoid bone
Five centimeter section from left femur midshaft

Burial 15

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section from left femur midshaft
Four carpal/wrist bones

Burial 16

Unerrupted maxillary left frontal incisor (9)
Unerrupted mandibular left canine (22)

Burial 17

Unerrupted maxillary right frontal incisor (8)
Unerrupted mandibular right canine (27)

Burial 19

Maxillary right frontal incisor (8)
Mandibular left canine (22)
Mandibular right canine (27)
Five centimeter section from left femur midshaft

Burial 21

Maxillary left frontal incisor (9)
Mandibular right canine (27)
Five centimeter section from left femur midshaft
Three sesamoid bones and hyoid bone

Burial 24

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Fifteen centimeter section of pathologic left femur midshaft

Burial 29

Mandibular left canine (22)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 34

Maxillary right frontal incisor (8)
Unerrupted mandibular right canine (27)

Burial 39

Maxillary right lateral canine (7)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 40

Unerrupted maxillary left frontal incisor (9)
Unerrupted mandibular left canine (22)

Burial 47

Maxillary left frontal incisor (9)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 48

Maxillary left frontal incisor (9)
Mandibular right canine (27)

Burial 54

Unerrupted maxillary left frontal incisor (9)
Unerrupted mandibular left canine (22)
Unerrupted mandibular right canine (27)

Burial 55

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 56

Unerrupted maxillary left frontal incisor (9)
Unerrupted mandibular left canine (22)

Burial 59

Unerrupted maxillary right frontal incisor (8)
Unerrupted mandibular right canine (27)

Burial 61

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 65

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 66

Five centimeter section of left femur midshaft

Burial 67

Maxillary left frontal incisor (9)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 68

Maxillary right frontal incisor (8)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 70

Maxillary right frontal incisor (8)
Mandibular left canine (22)
Five centimeter section of left femur midshafat
Two pieces of ossified costal cartilage
Ossified thyroid cartilage

Burial 77

Maxillary right frontal incisor (8)
Maxillary left lateral incisor (10)
Maxillary supernumary
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 78

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 79

Maxillary right frontal incisor (8)
Mandibular left second premolar (20)

Burial 81

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 82

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 83

Maxillary right frontal incisor (8)
Maxillary left frontal incisor (9)
Mandibular left canine (22)

Burial 84

Maxillary right canine (6)
Maxillary right front incisor (8)
Maxillary left front incisor (9)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 85

Unerrupted mandibular left canine (22)
Unerrupted mandibular right canine (27)

Burial 86

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 87

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 88

Unerrupted maxillary right frontal incisor (8)
Unerrupted mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 89

Maxillary right frontal incisor (8)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 90

Five centimeter section of left femur midshaft

Burial 92

Maxillary left frontal incisor (9)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 93

Mandibular left canine (22)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 94

Mandibular left canine (22)
Mandibular right canine (27)

Burial 95

Five centimeter section of left femur midshaft

Burial 96

Mandibular left canine (22)
Mandibular right canine (27)
Five centimeter section of left femur midshaft
2 pieces of ossified cartilage or sesamoids

Burial 97

Five centimeter section of left femur midshaft

Burial 100

Maxillary left frontal incisor (9)
Mandibular right canine (27)

Burial 101

Maxillary right frontal incisor (8)
Mandibular left canine (22)
Five centimeter section of left femur midshaft

Burial 102

Maxillary left frontal incisor (9)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 103

Maxillary left frontal incisor (9)
Mandibular right canine (27)
Five centimeter section of left femur midshaft

Burial 104

Maxillary left frontal incisor (9)
Mandibular left canine (22)

Burial 112

Unrupted maxillary right frontal incisor (8)
Unrupted mandibular left canine (22)

Burial 114

Unrupted maxillary left frontal incisor (9)
Unrupted mandibular right canine (27)
Unrupted mandibular left canine (22)

1 - Standard dental tooth numeration

TABLE AIII

Dental Casts from Cedar Grove Historic Cemetery

<u>Burial #</u>	<u>Mandibular</u>	<u>Maxillary</u>
10	X	X
14	X	
15	X	
21		X
24	X	X
29	X	
31	X	X
39	X	X
42	X	
47	X	X
48	X	X
55	X	X
61	X	
65	X	X
68	X	X
70		X
77	X	
81	X	X
82	X	X
83	X	
86	X	X
87	X	X
88	X	X
89	X	X
92	X	X
94	X	X
100	X	X
101	X	X
103	X	X
114	X	X

TABLE AIV

Skeletal Inventory for Cedar Grove Historic Cemetery

Key:

C = Complete Bone 90-100%

P = Partial Bone 50-90%

F = Fragmentary Bone 50% or less

A - Absent

TABLE A'IV
Skeletal Inventory for Cedar Grove Historic Cemetery

Burial Number	Frontal		Occipital		Sphenoid		Parietal		Temporal		Maxilla		Nasal		Zygomatic		Lacrimal		Palatine		Maxillary Teeth		Mandibular Teeth		Mandible		Ribs	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
10	C	C	C		F		C	C	C	C	P	P	P	P	P	P	P	P	P	P	C		C		C	C	C	C
14	C	C	P		P		C	P	C	C	P	P	C	C	C	C	C	C	P	P	C		C		C	C	P	P
15	C	C	C		P		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C		C	C	C	C
16	C	C	C		P		C	P	C	C	C	C	A	A	C	C	A	A	A	A	C		C		C	C	C	P
17	C	C	C		C		C	C	C	C	C	C	A	A	C	C	A	C	C	C	C		C		C	C	P	P
18	A	A	C		A		P	P	P	P	A	A	A	A	A	A	A	A	A	A	C		C		P	P	P	P
19	P	P	C		F		C	P	C	C	C	C	A	A	C	C	A	A	A	A	C		C		C	C	C	C
21	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C		C	P	C	C
24	C	C	C		P		C	C	C	C	C	C	P	P	A	A	A	A	C	C	C		C		C	C	P	P
25(A)	C	C	C		P		C	C	C	C	P	P	P	P	A	A	P	P	P	P	F		C		C	C	P	P
25(B)	C	C	C		P		C	C	C	C	P	F	P	P		P	P	P	A	A	C		C		C	C	P	P
29	A	A	A		A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	C		C		C	C	C	P
31	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C		C	C	C	C
33	C	C	C		F		C	C	C	C	P	P	F	F	F	F	F	F	P	P	C		C		C	C	C	C
34	C	C	C		P		C	C	C	C	P	P	A	A	P	P	A	A	A	A	C		C		C	C	C	C
35	P	P	P		P		P	P	P	P	P	P	F	F	P	P	F	F	P	P	C		C		C	C	C	C
36	P	P	P		P		A	A	P	A	C	A	A	A	C	P	A	A	A	A	C		C		C	C	C	C

TABLE AIV cont.

Burial Number	Frontal		Occipital		Sphenoid		Parietal		Temporal		Maxilla		Mnasal		Zygomatic		Lacrimal		Palatine		Maxillary Teeth		Mandibular Teeth		Mandible		Ribs	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
37	P	P	P		P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	C		C		P	P	P	P
38	P	P	P		P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	C		C		P	P	P	P
39	C	C	C		C		C	C	C	C	P	P	P	P	P	P	P	P	P	P	C		C		C	C	P	C
40	C	C	C		C		C	C	C	C	C	C	P	P	P	P	P	P	P	P	C		C		C	C	C	C
41	C	C	C		C		C	C	C	C	P	C	A	A	C	C	A	C	A	A	C		A		C	C	C	P
42	C	C	C		C		C	C	C	C	C	C	A	A	C	C	A	A	A	A	A		C		C	C	C	C
43	C	C	C		C		C	C	C	C	P	P	C	C	C	C	P	P	P	P	C		C		C	C	C	C
44	C	C	C		C		C	C	C	C	C	C	P	C	C	C	A	A	A	A	C		C		P	P	F	C
45	C	C	C		C		C	C	C	C	C	C	A	A	C	C	A	A	A	A	C		C		C	C	C	C
47	C	C	P		P		P	P	P	P	P	C	A	A	A	C	A	A	A	A	C		C		C	C	C	C
48	P	P	P		P		P	P	P	P	P	P	A	A	A	A	A	A	A	A	C		C		P	C	P	P
49	C	C	P		C		C	P	C	P	P	A	A	A	C	C	A	A	A	A	C		C		C	C	C	C
50	P	P	P		P		C	C	P	P	P	P	A	A	A	A	A	A	A	A	C		C		P	C	C	C
52	P	P	C		C		P	P	P	P	P	P	A	A	C	A	A	A	A	A	C		C		C	C	C	C
54	P	P	C		A		P	C	P	P	P	P	A	A	C	C	A	A	A	A	C		C		P	P	C	C
55	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	A	P	P	C		C		C	C	C	C
56	C	C	C		P		C	C	C	C	C	C	C	C	C	C	P	P	P	P	C		C		C	C	C	C
57	C	C	C		P		C	C	C	C	C	C	A	A	A	A	A	A	A	A	C		C		C	C	P	P
58	P	P	P		P		P	P	P	P	P	P	A	A	A	A	A	A	A	A	C		C		P	P	P	P

TABLE AIV cont.

Burial Number	Frontal		Occipital		Sphenoid		Parietal		Temporal		Maxilla		Nasal		Zygomatic		Lacrimal		Palatine		Maxillary Teeth		Mandibular Teeth		Mandible		Ribs	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
59	C	C	C		P		C	C	C	C	C	C	A	A	A	P	A	A	P	A	C		C		C	C	C	C
60	P	P	P		P		C	C	P	P	P	P	A	A	A	A	A	A	A	A	C		C		P	P	C	C
61	C	C	P		P		C	C	C	C	C	C	A	A	C	C	A	A	A	A	C		C		C	C	C	C
65	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C		C	C	C	C
66	P	P	P		P		C	C	C	C	P	P	A	A	C	C	A	A	A	A	C		C		C	C	C	C
67	C	C	C		C		C	C	C	C	C	C	P	C	C	P	P	P	C	P	C		C		C	C	C	C
68	C	C	C		P		C	C	C	C	C	C	P	P	C	C	P	P	P	P	C		C		C	C	C	C
69	P	P	C		P		P	P	C	C	C	C	P	P	C	C	P	P	P	P	C		C		C	C	C	C
70	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	P	P	C		C		C	C	P	P
77	C	C	C		P		C	C	C	C	C	C	P	P	C	C	A	A	P	C	C		C		C	C	C	C
78	C	C	C		P		C	C	C	C	C	C	P	P	C	C	C	C	C	C	C		C		C	C	C	C
79	A	A	P		A		A	A	A	C	A	P	A	A	A	A	A	A	A	A	C		F		F	F	F	F
80	P	P	P		P		P	P	C	C	P	P	P	P	P	P	P	P	P	P	C		C		C	A	F	F
81	P	P	C		P		P	C	P	C	P	P	A	A	P	C	A	A	A	A	C		C		C	C	C	C
82	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	P	P	C		C		C	C	C	C
83	C	C	C		P		C	C	C	C	C	C	P	P	C	C	P	P	C	C	C		C		C	C	C	C
84	C	C	C		P		C	C	C	C	P	P	P	P	P	P	P	P	P	P	C		C		C	C	C	C
85	P	P	P		P		P	P	P	P	A	A	A	A	A	A	A	A	A	A	C		C		P	P	P	P
86	C	C	C		C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C		C	C	C	C

Fig. 10. v. cont.

Burys Number	Frontal	Occipital	Sphenoid	Parietal	Temporal	Maxilla	Mandible	Zygomatic	Lacrimal	Palatine	Maxillary Teeth	Mandibular Teeth	Mandible	Ribs
	R	L	R	L	R	L	R	L	R	L	R	L	R	L
87	C	C	C	C	C	C	C	C	C	C	P	P	C	C
88	C	C	C	C	C	C	C	C	C	C	C	C	C	C
89	C	C	C	C	C	C	C	C	C	C	C	C	C	C
90	C	C	P	C	C	P	A	P	C	A	A	A	C	C
91	P	P	P	P	P	P	P	P	P	P	P	P	P	F
92	C	C	C	C	C	C	C	C	C	C	C	C	C	C
93	C	C	C	C	C	C	C	C	C	C	C	C	C	C
94	C	C	C	C	C	C	C	C	C	C	C	C	C	C
95	C	C	C	C	C	C	C	C	C	C	C	C	C	C
96	C	C	P	C	C	P	P	P	P	P	P	P	C	P
97	A	A	A	A	A	A	A	A	A	A	A	A	A	F
100	C	C	C	C	C	C	C	C	C	C	C	C	C	C
101	C	C	C	C	C	C	C	C	C	C	C	C	C	C
102	C	C	P	C	C	P	A	A	A	A	A	A	C	C
103	C	C	C	C	C	C	C	C	C	C	C	C	C	C
104	P	P	P	P	P	P	A	A	A	A	A	A	C	C
105	P	P	C	P	P	A	A	A	A	A	A	A	C	P
106	P	P	P	P	P	F	F	F	F	F	F	F	C	P
107	P	P	P	P	P	P	A	C	C	A	A	A	C	C
108	P	P	P	P	P	P	A	A	A	A	A	A	C	C
109	P	P	P	P	P	P	A	C	C	A	A	A	C	P
110	P	P	P	P	C	C	A	A	A	A	A	A	C	P
111	P	P	P	P	C	C	P	A	C	A	A	A	C	P
112	P	P	P	P	P	A	A	A	A	A	A	A	C	P
114	C	C	C	C	C	C	C	C	C	P	A	A	C	C

TABLE AIV cont.

Burial Number	Vertebrae																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	Scapula				Clavicle				Sternum				Cervical				Thoracic				Lumbar				Sacrum				Humerus				Radius				Ulna				Carpals				Metacarpals				Phalanges				Innominate				Femur																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L

TABLE AIV cont.

Burial Number	Scapula		Clavicle		Sternum		Cervical		Thoracic		Lumbar		Sacrum		Humerus		Radius		Ulna		Carpals		Metacarpals		Phalanges		Innominate		Femur	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
39	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
40	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	F	C	C	C	C	C	C
41	P	P	C	C	C	C	C	C	C	C	P	P	P	P	C	C	C	C	C	C	P	P	C	C	14	P	P	P	P	P
42	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	P	C	C	21	C	C	C	C	C
43	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	P	P	P	C	C	C	C	C	C
44	C	C	C	C	C	C	P	P	F	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	20	C	C	C	C	C
45	C	C	C	C	C	C	C	C	C	C	C	C	P	P	C	C	C	C	C	C	A	A	P	P	6	C	C	C	C	C
47	P	P	P	P	P	P	P	P	C	C	C	C	P	P	P	P	P	P	P	P	P	P	C	C	20	P	P	P	P	P
48	P	P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	20	C	C	C	C	C
49	C	C	C	C	P	P	P	P	P	P	P	P	P	P	C	C	C	C	C	C	A	A	A	A	1	P	P	C	C	C
50	P	P	C	C	F	F	C	C	C	C	C	C	F	F	P	P	A	P	P	P	A	A	F	F	2	P	C	C	C	C
52	C	P	C	C	P	P	P	P	P	P	P	P	P	P	C	C	C	C	C	C	A	A	P	P	14	C	C	C	C	C
54	A	P	C	C	P	P	C	C	C	C	C	C	P	P	C	P	C	P	C	F	F	F	F	8	C	C	C	C	C	C
55	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	14	C	C	C	C	C
56	C	C	C	C	C	C	C	C	C	C	C	C	P	P	C	C	C	C	C	C	F	F	F	F	C	C	C	C	C	C
57	C	P	C	C	C	C	C	C	C	C	C	C	P	P	C	C	C	C	C	C	F	F	C	C	11	C	C	C	C	C
58	A	A	A	P	F	F	F	F	F	F	F	F	F	F	P	A	A	A	A	A	A	A	A	A	6	C	A	C	A	A
59	P	P	C	C	P	P	P	P	P	P	P	P	P	P	C	C	C	C	C	C	A	A	A	F	13	C	C	C	C	C
60	P	P	A	A	F	F	P	P	P	P	P	P	F	F	P	A	A	A	P	A	A	A	A	A	2	C	C	C	C	A

TABLE AIV cont.

Burial Number	Scapula		Clavicle		Sternum		Cervical		Thoracic		Lumbar		Sacrum		Humerus		Radius		Ulna		Carpals		Metacarpals		Phalanges		Innominate		Femur	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
61	C	P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	10	C	C	C	C	C
65	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	C	C	C	C	C
66	C	C	C	C	C	C	C	C	C	C	C	C	F	C	C	C	P	C	C	C	P	C	C	C	27	C	C	C	C	C
67	P	P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	C	C	C	C	C	C	20	C	C	C	C	C
68	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	28	C	C	C	P	C
69	P	P	C	F	P	C	C	C	C	C	C	C	P	C	C	C	C	C	C	C	F	F	F	F		C	C	C	C	C
70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	15	C	C	C	C	C
77	P	P	C	C	C	C	C	C	P	C	P	C	C	C	C	C	C	C	C	C	C	C	C	C	23	C	C	C	C	C
78	P	P	P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	F	F	F	9	C	C	C	C	C
79	A	A	A	A	A	A	F	F	F	A	A	A	F	A	A	A	A	A	A	A	F	A	F	F	3	A	A	A	A	P
80	C	C	C	C	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	F		C	C	C	C	C
81	P	P	P	C	C	C	C	C	C	C	C	C	A	C	C	C	P	P	P	C	C	C	C	C	24	C	P	C	C	C
82	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	C	C	C	C	C
83	P	P	C	C	P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	P	P	P		C	C	C	C	C
84	P	P	P	P	P	C	C	C	C	C	C	C	F	C	C	C	C	C	C	C	P	P	P	P		C	C	C	C	C
85	A	P	C	A	F	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A	A	F	F	F		P	P	P	P	P
86	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	C	C	C	19	C	C	C	C	C
87	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	C	C	C	14	C	C	C	C	C
88	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	C	P	P	7	C	C	C	C	C

TABLE AIV cont.

Burial Number	Scapula		Clavicle		Sternum		Cervical		Thoracic		Lumbar		Sacrum		Humerus		Radius		Ulna		Carpals		Metacarpals		Phalanges		Innominate		Femur	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
89	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	19		C	C	C	C
90	P	P	C	C	P		P		P		P		P		C	C	C	C	P	C	C	C	C	C	16		P	P	P	P
91	A	A	A	A	P		F		F		F		F		P	P	P	P	P	P	P	P	P	P	4		A	P	P	P
92	P	C	C	C	C		C		C		C		C		C	C	C	C	C	C	C	C	C	C	13		C	C	C	C
93	C	C	C	C	C		C		C		C		C		C	C	C	C	C	C	C	C	C	C	19		C	C	C	C
94	P	P	C	C	C		C		C		C		C		C	C	C	C	C	C	C	C	C	C	12		C	C	C	C
95	P	P	C	C	C		C		C		C		C		C	C	C	C	C	C	C	C	C	C	15		C	C	C	C
96	P	P	C	C	P		C		P		C		C		C	P	P	P	P	P	P	P	P	P	6		P	C	C	C
97	F	A	A	A	A		A		A		C		C		C	A	C	A	C	A	F	F	C	C	12		P	C	C	C
100	P	P	C	C	P		C		C		C		C		C	C	C	C	C	C	F	F	C	C	12		C	C	C	C
101	C	C	C	C	C		C		C		C		C		C	C	C	C	P	P	P	P	C	C	25		C	P	C	C
102	P	P	P	C	P		P		P		P		P		A	A	P	C	C	C	P	C	P	C	19		P	P	C	C
103	C	C	C	C	C		C		C		C		C		C	C	C	C	C	C	C	C	C	C	22		C	C	C	C
104	P	P	C	P	C		C		C		C		C		C	C	C	C	C	F	F	F	F	F	6		C	C	P	P
105	C	C	C	C	P		C		C		C		C		C	C	C	C	C	F	F	F	F	F			C	C	C	C
106	C	C	C	C	F		C		C		C		C		C	C	C	C	C	F	F	F	F	F			C	C	C	C
107	P	P	C	C	P		P		P		P		P		C	C	C	C	C	F	F	F	F	F			P	P	C	C
108	P	P	C	C	P		P		P		P		P		P	P	P	P	P	A	A	A	A	A			C	C	C	C
109	P	P	C	C	P		C		C		C		P		C	C	C	C	C	F	F	F	F	F			P	P	C	C
110	A	C	C	C	P		P		P		P		P		C	C	C	C	C	F	F	F	F	F			P	P	C	C
111	C	C	C	C	A		C		C		C		P		C	C	C	C	C	F	F	F	F	F	7		C	C	C	C
112	C	C	P	C	P		P		P		P		P		C	C	A	C	A	A	A	A	A	A			A	C	C	C
114	C	C	C	C	C		C		C		C		A		C	P	C	C	C	F	F	F	F	F			C	C	C	C

TABLE AIV cont.

Burial Number	Patella		Tibia		Fibula		Tarsals		Metatarsals		Phalanges		Burial Number	Patella		Tibia		Fibula		Tarsals		Metatarsals		Phalanges	
	R	L	R	L	R	L	R	L	R	L	R	L		R	L	R	L	R	L	R	L	R	L	R	L
10	C	C	C	C	C	C	C	P	C	C	C	11	39	C	C	C	C	C	C	C	C	C	C	C	18
14	C	C	C	C	C	P	C	C	C	C	C	15	40	A	A	C	C	C	C	F	F	F	F	F	
15	C	C	C	C	C	C	C	C	C	C	C	13	41	P	P	P	P	P	P	P	C	C	C	C	6
16	A	A	P	C	P	C	A	F	F	F	F	12	42	C	C	C	C	C	C	C	C	C	C	C	20
17	A	A	C	C	P	P	F	F	F	F	A	1	43	C	C	C	C	C	C	P	P	P	P	P	
18	A	A	A	C	F	F	F	F	F	F	F	7	44	C	C	C	C	C	C	P	P	C	C	C	20
19	C	A	C	C	P	P	F	F	P	P	P	1	45	A	A	C	C	C	C	P	P	P	P	P	7
21	C	C	C	C	P	P	C	C	C	C	C	4	47	A	C	P	C	P	P	C	C	C	C	C	24
24	C	C	P	C	P	C	P	P	P	P	P	12	48	C	C	C	C	C	C	C	C	C	C	C	20
25(A)	A	A	C	C	C	C	F	F	F	F	F		49	A	A	C	C	C	C	A	A	A	A	A	1
25(B)	A	A	C	C	C	C	F	F	F	F	F		50	A	A	C	C	P	A	F	F	F	F	F	
29	C	C	C	C	C	C	C	C	C	C	C	15	52	A	A	C	C	C	C	A	A	F	F	F	7
31	A	C	C	C	C	C	F	F	C	C	C	15	54	A	A	P	C	P	P	A	A	A	A	A	
33	A	A	C	C	C	C	C	P	P	P	P		55	C	C	C	C	C	C	C	C	C	C	C	10
34	A	A	P	C	C	C	A	A	A	A	A		56	C	C	C	C	C	C	F	F	F	F	F	
35	A	A	C	C	C	C	C	C	C	C	C		57	C	A	C	C	C	P	F	F	P	P	P	4
36	A	A	C	C	C	C	F	F	C	C	C	3	58	A	A	C	A	C	A	A	A	A	A	A	3
37	A	A	P	P	A	A	F	F	F	F	F		59	A	A	C	C	P	A	F	F	F	F	F	8
38	A	A	C	C	C	C	F	F	F	F	F		60	C	A	C	A	P	A	A	A	A	A	A	1

TABLE AIV cont.

Burial Number	Patella			Tibia			Fibula			Tarsals			Metatarsals			Phalanges		
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
61	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	21
65	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	14
66	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	5
67	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	11
68	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	C	15
69	A	A	C	C	C	C	C	C	C	F	F	F	F	F	C	C	C	12
70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	15
77	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	7
78	A	A	C	C	C	C	C	C	F	F	P	C	C	C	C	C	C	8
79	A	A	A	A	A	A	A	A	A	F	A	A	F	A	C	C	P	
80	A	A	C	C	C	C	C	C	C	F	F	F	F	F	C	C	C	8
81	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	26
82	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	9
83	A	A	C	C	C	C	C	C	C	P	P	P	P	P	F	F	F	1
84	A	A	C	C	C	C	C	C	C	P	P	P	P	P	F	F	F	5
85	A	A	P	A	A	A	A	A	F	F	F	F	F	F	F	F	F	
86	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	
87	C	C	C	C	C	C	C	C	C	P	P	C	C	C	F	F	F	
88	A	A	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	
89	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
90	C	P	P	P	P	P	P	P	P	C	C	C	C	C	C	C	C	
91	A	A	P	P	A	A	A	A	A	P	P	P	P	P	F	F	F	
92	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
93	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
94	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
95	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
96	C	C	C	P	C	P	P	P	P	C	C	C	C	C	C	C	C	
97	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
100	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P	
101	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
102	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
103	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
104	A	A	P	C	P	P	P	P	P	F	F	F	F	F	F	F	F	
105	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
106	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
107	A	A	C	C	C	C	C	C	C	P	P	P	P	P	F	F	F	
108	A	A	P	P	P	P	P	P	P	P	P	P	P	P	F	F	F	
109	A	A	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	
110	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	
111	A	A	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	
112	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
114	A	A	C	C	C	C	C	C	C	C	C	C	C	C	F	F	F	

TABLE AV

Cranial Nonmetric Traits from Cedar Grove Historic Cemetery

KEY:

- 1 = Trait absent
- 2 = Trait present
- 3,4,5 = Trait variant (after Buikstra N.D.)
- 9 = Unobservable

TABLE AV

Cranial Nonmetric Traits from Cedar Grove Historic Cemetery

Burial Number	Epipteric Bone		Asterion Bone		Parietal Notch Bone		Os Lambda Suture		Os Coronale Suture		Os Japonicum		Infra-orbital Suture		Parietal Notch		Supra-orbital Notch		Supra-orbital Foramen		Accessory Supra- orbital Foramen	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	2	2	1	1	1
14	1	1	1	1	2	9	9	2	1	1	1	1	9	9	2	2	1	1	1	1	1	1
15	2	9	2	2	1	1	1	1	1	1	1	1	9	9	2	2	2	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	2	1	1	2	1	1
24	9	9	1	1	1	1	2	1	1	1	1	1	9	9	2	3	9	3	2	2	1	1
29	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	1	1	1	1
39	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	9	1	9	1	9
41	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	3	2	2	1	1	1	1
42	1	1	1	1	1	1	2	2	1	1	1	1	9	9	4	3	1	3	1	1	1	1
44	9	1	1	1	1	1	1	1	1	1	1	1	9	9	3	3	1	1	2	2	1	1
47	9	9	1	1	1	1	1	1	1	1	1	1	9	3	3	3	2	1	1	2	1	2
61	1	1	1	1	1	1	1	1	1	1	1	1	9	9	2	2	9	3	1	1	1	1
65	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	2	2	1	1
66	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	9	1	9	1	1	1	1
67	9	9	9	9	1	1	9	9	9	9	9	9	9	9	3	3	1	1	2	2	1	1
68	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	1	1

TABLE AV cont.

Burial Number	Epipteric Bone		Asterionic Bone		Parietal Notch Bone		Os Lamdoid Suture		Os Coronai Suture		Os Japonium		Infra-orbital Suture		Parietal Notch		Supra-orbital Notch		Supra-orbital Foramen		Accessory Supra- orbital Foramen	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
70	9	9	1	1	1	1	9	9	9	9	1	1	1	1	4	4	1	1	2	2	1	1
77	1	1	1	1	9	1	2	1	1	1	1	1	9	1	9	2	2	2	1	1	1	1
79	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
81	9	9	9	9	1	1	1	1	1	1	1	1	9	9	9	4	9	9	2	2	1	1
82	1	1	9	9	1	1	9	9	9	9	1	1	1	1	3	4	1	1	1	1	1	1
86	1	1	2	2	1	1	1	1	9	9	1	1	9	9	2	3	2	1	1	1	1	1
87	1	1	1	1	1	1	1	1	1	1	1	1	3	1	3	3	2	2	1	1	1	1
89	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
90	9	9	1	1	1	1	9	9	9	9	1	1	9	9	3	3	1	1	2	2	1	1
92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1
93	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
94	1	1	1	1	1	1	1	2	1	1	1	1	1	1	4	4	2	2	1	1	1	1
95	9	9	9	9	9	9	9	9	1	1	9	1	9	9	9	9	9	9	9	9	9	9
96	1	1	1	1	1	1	1	1	1	1	1	1	9	9	1	1	1	2	2	2	1	1
97	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
102	9	9	9	9	1	1	9	9	9	9	1	1	9	1	1	1	1	1	2	2	1	1
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	2	1	1	1	1

TABLE AV cont.

Burial Number	Multiple mental Foramen		Mylo-hyoid Arch		Accessory orbital Foramina		Tympanic Dischisance		Auditory Exostoses		Divided Hypo-glossal Canal		Post-Condylar Canal not Patent		Foramen Ovale incomplete		Foramen Spinosum open to Foramen lacerrum	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
10	1	1	1	1	1	1	1	1	1	1	2	9	9	9	9	9	9	9
14	1	1	1	1	9	9	1	1	1	1	1	1	1	1	9	9	9	9
15	1	1	2	1	9	9	1	1	1	1	1	3	9	9	1	9	9	9
21	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
24	1	1	1	1	9	9	1	2	1	1	9	5	9	9	9	9	9	9
29	1	1	1	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9
31	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1
39	1	1	1	1	9	9	9	9	1	1	1	9	9	9	9	9	9	9
41	1	1	1	1	1	1	1	2	1	1	1	1	9	9	1	1	1	1
42	1	1	1	1	9	9	1	1	1	1	1	1	1	1	1	1	1	1
44	1	1	9	1	9	9	1	1	1	1	1	1	2	2	1	1	1	1
47	1	1	1	1	9	1	1	1	1	1	1	1	9	9	9	9	9	9
61	1	1	1	1	9	9	1	1	1	1	1	9	9	9	1	1	1	1
65	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
66	1	1	1	1	9	9	1	1	1	1	9	1	1	1	1	1	1	1
67	1	1	1	1	1	1	1	1	1	1	5	5	9	9	1	1	1	1
68	1	1	1	2	1	9	1	1	1	1	1	9	1	9	1	1	1	1
70	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
77	2	2	1	1	9	9	1	1	1	1	1	1	9	9	9	9	9	9

TABLE AV cont.

Burial Number	Multiple mental Foramen		Mylo-hyoid Arch		Accessory Infra- orbital Foramina		Tympanic Dihiscence		Auditory Exostoses		Divided Hypo- glossal Canal		Post-Condylar Canal not Patent		Foramen Ovale Incomplete		Foramen Spinosum open to Foramen lacerum	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
79	9	9	9	9	9	9	9	9	9	9	2	2	1	1	9	9	9	9
81	2	2	1	1	9	9	1	1	1	1	2	5	9	9	9	1	9	1
82	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	2	2
86	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	2	1
87	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
89	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
90	1	1	1	5	9	9	1	1	1	1	1	9	9	9	1	1	1	1
92	2	2	1	1	1	2	1	1	1	1	1	3	1	2	1	1	1	1
93	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1
94	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95	9	9	9	1	9	9	9	1	9	1	9	9	9	9	9	9	9	9
96	1	1	1	1	9	9	1	1	1	1	9	9	9	9	9	9	9	9
97	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
102	1	1	1	1	9	1	1	1	1	1	1	9	9	9	9	9	9	9
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1

TABLE AV cont.

Burial Number	Multiple Zygomatico- facial Foramen	Pterygo- alar Spurs	Pterygo- spinous Spurs	Metopic Suture Open	Bregmatic Bone	Iaca Bone	Apical Bone	Os Sagittal Suture	Superior Sagittal Sulcus turns right	Mandibular Torus	Palatine Torus	Burial Number	Obelion Foramen
10	4	9	9	9	1	1	1	1	2	2	2	10	1
14	2	9	9	9	1	1	1	1	2	1	9	14	2
15	4	9	9	9	1	1	1	1	2	1	2	15	1
21	1	9	9	9	2	1	1	1	9	1	2	21	1
24	1	9	9	9	2	1	2	1	1	1	1	24	1
29	9	9	9	9	9	9	9	9	9	1	9	29	9
31	1	9	9	9	1	1	1	1	9	1	2	31	2
39	9	9	9	9	1	1	2	1	1	1	1	39	2
41	1	9	9	9	1	1	1	1	9	9	1	41	9
42	2	9	9	9	1	1	1	1	9	9	1	42	2
44	1	2	1	1	1	1	1	1	2	1	1	44	2
47	9	9	9	9	1	1	1	1	2	1	1	47	1
61	7	9	9	9	1	1	9	1	2	1	6	61	1
65	1	9	9	9	1	1	1	1	9	1	2	65	1
66	5	9	9	9	1	1	1	1	2	9	9	66	9
67	2	9	9	9	1	9	9	9	2	1	1	67	1
68	5	9	9	9	1	1	1	1	2	1	3	68	1
70	4	1	2	9	1	9	9	9	9	1	1	70	2
77	1	9	9	9	1	1	1	1	1	2	1	77	2

TABLE AV cont.

Burial Number	Multiple Zygomatico- facial Foramen		Pterygo- alar Spurs		Pterygo- spinosus Spurs		Mastoidic Suture Open		Bregmatic Bone		Inca Bone		Apical Bone		Os Sagittal Suture		Superior Sagittal Sulcus turns Right		Mandibular Foram		Palatine Foram		Burlal Number		Duellonic Formaline	
	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L	N	L
79	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	79	9	9	9
81	1	1	9	9	9	9	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	81	1	1	1	1
82	1	2	9	9	9	9	1	1	9	9	9	9	9	9	9	9	9	9	9	9	1	82	2	2	2	2
86	7	7	1	2	1	1	1	1	9	1	1	1	1	1	9	9	2	1	1	1	2	86	1	2	1	2
87	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1	1	1	87	2	1	2	1
89	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	89	1	1	1	1
90	7	1	1	1	1	1	2	9	9	9	9	9	9	9	9	1	1	1	1	1	1	90	1	1	1	1
92	4	1	9	9	9	9	1	1	1	2	1	1	1	1	1	1	9	1	1	1	1	92	2	2	2	2
93	5	1	9	9	9	9	1	1	1	1	1	1	1	1	1	1	9	1	1	1	1	93	1	1	1	1
94	1	1	9	9	9	9	1	1	1	1	1	1	1	1	1	1	9	2	2	2	9	94	2	2	2	2
95	9	1	9	9	9	9	1	1	1	1	1	1	1	1	1	1	9	1	9	9	9	95	2	2	2	2
96	1	1	9	9	9	9	1	1	1	1	1	1	1	1	1	1	2	1	1	1	9	96	2	1	1	1
97	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	97	9	9	9	9
102	1	7	9	9	9	9	1	1	1	9	9	9	9	9	9	9	1	1	1	1	1	102	1	2	1	2
103	7	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	103	1	1	1	1

TABLE AVI

Postcranial Nonmetric Traits from Cedar Grove Historic Cemetery

KEY:

- 1 = Trait absent
- 2 = Trait present
- 3,4,5 = Trait variant (after Buikstra N.D.)
- 9 = Unobservable

TABLE AV1
Postcranial Nonmetric Traits from Cedar Grove Historic Cemetery

Burial Number	Atlas: Lateral Bridging		Atlas: Posterior Bridging		C3: Accessory Foramina		C4: Accessory Foramina		C5: Accessory Foramina		C6: Accessory Foramina		C7: Accessory Foramina		Humerus: Septal Aperture		L5: Spondylolysis	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
10	1	1	1	1	1	1	1	1	1	1	5	1	5	1	1	1	1	1
14	9	1	1	1	1	1	2	2	1	2	9	2	1	1	2	3	1	1
15	1	3	3	3	1	1	9	9	9	1	5	4	9	9	3	1	9	9
21	1	1	1	1	1	1	1	1	1	1	1	1	9	9	1	1	1	1
24	1	1	3	3	1	1	1	1	2	2	1	2	9	9	1	1	1	1
29	9	9	9	9	9	9	1	1	1	1	9	9	9	9	2	9	1	1
31	1	1	1	1	9	9	1	9	1	1	9	9	9	9	1	1	9	9
39	1	1	2	3	1	1	1	1	1	1	1	1	1	1	2	2	9	9
41	1	1	1	1	1	1	1	1	1	1	1	1	9	9	2	3	1	1
42	1	1	2	3	1	1	1	1	1	1	1	1	1	1	2	1	1	1
44	1	1	1	1	1	9	9	9	9	9	9	9	9	9	1	1	9	9
47	1	1	1	1	1	1	1	1	1	1	9	9	9	9	1	1	9	9
61	1	1	1	1	9	1	9	9	9	9	9	9	9	9	9	9	1	1
65	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1
66	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9
67	1	1	1	1	1	1	1	1	1	1	2	2	9	9	1	1	1	1
68	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE AVI cont.

Burial Number	Atlas: Lateral Bridging		Atlas: Posterior Bridging		C3: Accessory Foramina		C4: Accessory Foramina		C5: Accessory Foramina		C6: Accessory Foramina		C7: Accessory Foramina		Humerus: Septal Aperture		L5: Spondylolysis	
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L	R	L
70	1	1	1	1	1	1	1	1	2	2	3	2	5	5	1	1	1	1
77	9	9	9	9	1	1	1	1	1	1	1	1	2	2	1	1	9	9
79	9	9	9	9	1	1	5	5	9	9	9	9	9	9	9	9	9	9
81	1	1	3	3	1	1	1	1	1	1	1	1	1	1	2	3	1	1
82	1	1	1	1	1	1	1	1	1	1	9	3	9	2	2	2	1	1
86	1	1	1	1	5	1	1	1	1	9	9	9	9	9	2	2	1	1
87	9	1	2	1	1	1	1	1	1	1	1	5	9	9	1	1	1	1
89	1	1	1	1	1	1	1	1	5	5	5	5	1	1	1	1	1	2
90	1	1	1	1	9	9	1	9	9	9	9	9	9	9	2	2	1	1
92	1	1	3	2	1	1	1	1	1	1	1	1	1	4	1	1	1	1
93	1	1	1	2	1	1	1	1	4	2	1	2	5	1	1	1	1	1
94	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1
95	1	1	1	1	9	9	1	1	9	9	1	1	1	1	1	1	9	9
96	1	1	2	2	1	1	9	9	9	9	9	9	9	9	1	9	1	1
97	9	9	9	9	9	9	9	9	9	9	9	9	9	9	2	9	9	9
102	1	1	1	1	1	1	1	1	4	4	9	9	9	9	2	1	1	1
103	2	3	1	1	1	1	1	1	1	1	5	4	4	4	2	2	1	1

TABLE AVII

Skeletal Metrics for Cedar Grove Historic Cemetery

KEY

D (next to burial number) indicates diaphysial lengths.

Cranium

1. Max. Length
2. Max. breadth
3. Max. height
4. Porion-Bregma ht.
5. Basion-nasion ht.
6. Prosthion-nasion ht.
7. Bizygomatic brd.
8. Orbital ht.
9. Orbital brd.
10. Nasal width
11. Basion-Prosthion ht.
12. Bicondylar brd.
13. Mandibular lth.
14. Ascending ramus ht.
15. Symphyseal ht.

Scapula

16. Max. length
17. Max. breadth

Clavicle

18. Max. length
19. Circum. midshaft

Humerus

20. Max. length
21. Min. Diam. head
22. Circum. Midshaft

Radius

23. Max. length

Ulna

24. Max. length
25. Phys. length

Sacrum


26. Max. ant. ht.
27. Max. ant. brd.

Innominate

28. Max. height
29. Max. breadth
30. Ischial lth.
31. Pubis lth.

Femur

32. Max. lth.
33. Phys. lth.
34. Max. diam. head



35. Circum. midshaft

36. Subtro. A-P diam.

37. Subtro. M-L diam.

Tibia

38. Max. lth.

39. A-P diam.

40. M-L diam.

Fibula

41. Max. length





TABLE AVII
Skeletal Metrics for Cedar Grove Historic Cemetery (in centimeters)

Burial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18R	18L	19R	19L	20R
10	18.8	---	---	12.6	---	---	---	---	---	---	---	12.3	8.8	6.0	3.4	---	---	15.5	16.5	4.7	4.4	36.5
14	---	---	---	---	---	---	---	---	---	---	---	12.2	8.3	4.7	3.2	---	---	---	13.1	---	3.0	---
15	19.4	---	---	13.3	---	---	---	---	---	---	---	11.7	10.0	5.9	4.1	---	---	---	17.4	---	4.4	37.4
160	---	---	---	---	---	---	---	---	---	---	---	8.9	5.1	3.0	2.2	---	---	---	---	---	---	---
170	---	---	---	---	---	---	---	---	---	---	---	8.2	5.7	2.7	1.9	5.8	4.2	---	6.8	---	1.9	---
180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
190	---	---	---	---	---	---	---	---	---	---	---	10.1	6.4	4.1	2.6	---	---	---	10.0	---	2.0	---
21	18.2	13.6	12.8	12.4	9.5	6.2	---	3.3	3.9	2.7	9.6	---	9.3	5.0	3.8	---	10.7	---	14.5	---	4.0	---
24	---	---	---	---	---	---	---	---	---	---	---	11.5	8.1	5.7	3.5	---	---	---	15.0	---	4.0	32.7
25(A)D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.4	2.1	3.1	---	---	---	---
25(B)D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.6	2.6	---	3.4	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	12.0	8.3	4.6	3.2	---	---	---	---	---	---	30.7
31	17.4	13.3	13.0	12.0	9.4	6.5	13.1	3.3	4.2	2.6	9.9	11.3	8.3	5.9	3.1	15.0	10.1	---	15.3	---	4.0	---
330	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.6	---	1.8	---
34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.8	2.3	---	3.2	---	9.0	---
360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.1	---	---	3.6	---	1.2	---

TABLE AVII cont.

Burial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18R	18L	19R	19L	20R
370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.4	---	---	---
39	---	---	---	---	---	---	---	---	---	---	---	12.8	8.3	5.7	2.8	15.6	10.5	---	15.0	---	2.7	---
400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.3	5.9	4.5	---	6.9	---	1.7	---
41	17.1	13.5	13.2	12.5	9.7	---	---	---	---	---	---	11.5	9.0	5.4	1.6	---	---	---	---	---	3.9	---
42	17.4	14.5	13.5	13.0	9.5	---	---	---	---	---	---	12.5	9.1	5.4	2.1	---	11.0	---	14.8	---	3.3	---
43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.3	---	---	---	---	---	---	---
44	16.8	13.9	13.3	---	---	---	---	---	---	---	---	---	---	---	3.8	---	---	---	---	---	---	---
450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.0	2.6	3.9	---	1.0	---
47	---	---	---	---	---	---	---	---	---	---	---	11.7	8.0	4.3	3.4	---	---	---	---	---	3.5	---
480	---	---	---	---	---	---	---	---	---	---	---	---	---	5.4	3.5	---	---	---	14.1	---	3.8	---
490	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.2	---	---	---
500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.3	---	1.8	---
520	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.7	3.1	---	4.8	---	1.3	---
540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.8	---	1.8	12.8
550	16.3	14.3	13.5	13.1	9.4	---	---	---	---	---	---	---	---	---	---	---	---	15.1	---	4.0	---	---
Mixed	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
560	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
570	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.0	---	2.2	---
58	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE AVII cont.

Burial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18R	18L	19R	19L	20R
590	---	---	---	---	---	---	---	---	---	---	---	7.9	4.8	2.7	2.1	---	---	---	6.7	---	1.3	---
60	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
61	19.4	14.9	---	13.3	---	---	---	---	---	---	---	---	8.7	4.5	3.5	---	13.6	17.5	---	4.4	---	---
65	18.6	13.8	13.5	12.9	9.9	7.3	---	3.8	4.1	2.6	9.6	11.7	9.4	6.5	3.3	15.1	11.0	---	15.5	---	3.6	---
66	---	---	---	---	---	---	---	---	---	---	---	12.6	9.4	4.8	2.7	---	10.9	---	13.7	---	3.8	---
67	17.6	12.4	12.5	11.5	9.8	---	---	---	---	---	---	11.7	8.5	5.0	3.0	---	---	14.4	---	4.0	---	34.6
68	18.5	14.1	---	13.6	---	---	14.2	---	---	---	---	13.0	8.7	7.0	3.1	---	11.3(L) 11.4(R)	16.4	17.6	4.8	4.9	35.2
69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
70	18.4	13.9	13.6	13.2	10.1	6.6	13.7	3.6	4.6	2.9	10.0	12.6	8.7	5.2	3.3	15.0	9.9	---	14.5	---	4.3	---
77	---	---	---	---	---	---	---	---	---	---	---	---	8.6	7.1	3.6	---	---	15.5	---	4.4	---	---
780	---	---	---	---	---	---	---	---	---	---	---	---	---	4.4	2.6	---	---	---	9.1	---	2.3	---
79	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
800	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.3	2.8	---	4.4	---	1.1	---
81	---	---	---	---	---	---	---	---	---	---	---	11.6	9.7	5.8	3.1	---	---	---	16.2	---	3.7	33.6
82	18.1	12.6	13.0	12.0	10.0	6.2	13.4	3.7	4.0	2.4	9.8	12.2	8.8	5.4	2.8	---	---	---	16.6	---	4.0	---
830	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.9	---	3.2	---	---
84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
85	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
86	18.4	14.2	13.7	12.7	10.2	5.8	---	3.4	4.0	3.0	10.2	12.2	9.3	4.9	3.4	---	11.0	---	15.3	---	3.9	---

TABLE AVII cont.

Burial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18R	18L	19R	19L	20R
87	18.6	14.0	13.4	12.3	10.2	7.4	14.1	3.8	4.6	3.1	10.0	13.2	8.6	6.7	3.8	---	12.2	---	17.2	---	4.3	---
88	---	---	---	---	---	---	---	---	---	---	---	---	6.2	4.1	2.6	7.6	5.9	---	8.6	---	2.0	---
89	18.0	14.0	14.2	12.9	10.4	6.6	13.4	3.7	4.3	2.5	9.3	12.0	9.0	4.6	3.8	16.3	12.3	---	16.5	---	4.3	---
90	18.0	13.7	---	12.6	---	---	---	---	---	---	---	---	---	---	2.1	---	---	---	16.0	---	4.5	---
91	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
92	18.1	13.9	13.6	13.2	9.9	6.9	13.6	3.6	4.2	2.4	9.5	12.5	8.4	3.4	5.4	14.7	10.9	---	15.4	---	3.5	---
93	18.5	14.0	13.5	13.2	9.6	6.6	13.2	3.5	4.0	2.6	9.5	12.6	8.3	5.0	3.9	13.0	10.5	---	15.3	---	4.0	---
94	18.5	13.3	13.7	13.1	9.8	---	---	---	---	---	---	11.0	8.0	4.6	3.3	---	---	---	---	---	---	---
95	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
96	18.6	14.2	---	13.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15.0	---	4.0	---
97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
100	16.8	---	---	11.7	---	---	---	---	---	---	---	---	---	---	---	---	---	10.8	---	2.7	---	---
101	---	---	---	---	---	---	---	---	---	---	---	10.4	8.1	4.6	2.9	12.5	---	---	12.1	---	3.8	---
102	18.1	12.4	---	11.4	---	---	---	---	---	---	---	---	7.8	5.2	3.5	---	---	---	13.0	---	3.5	---
103	17.3	12.8	12.7	11.9	9.3	5.7	12.5	3.3	4.0	2.6	9.2	11.3	8.2	6.0	3.1	---	9.5	---	13.8	---	3.8	---
104	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
105	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.6	---	1.5	---
106	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.4	---	1.1	---
107	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.4	---	1.3	---	---
108	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.3	---	1.8	---
109	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.8	3.0	---	3.5	---	0.9	---
110	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
111	---	---	---	---	---	---	---	---	---	---	---	8.3	4.8	2.9	1.9	---	---	---	6.5	---	1.8	---
112	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.7	---	1.1	---
114	---	---	---	---	---	---	---	---	---	---	---	7.9	5.8	2.0	2.0	---	---	---	5.8	---	1.8	---

TABLE AVII CONT.

Serial #	20L	20R	21L	22L	22R	23L	23R	24L	24R	25L	25R	26L	26R	27L	27R	28L	28R	29L	29R	30L	30R	31L	31R	41L
10	36.7	5.1	5.1	8.0	7.6	27.7	28.0	29.4	29.3	25.8	25.7	12.0	12.1	23.2	23.6	17.1	17.1	17.1	17.1	10.1	9.9	3.3	42.3	42.4
14	33.3	---	4.2	---	6.1	---	---	---	---	---	---	---	10.7	---	---	19.5	15.5	---	---	---	---	---	30.8	---
15	---	4.6	---	7.0	---	---	30.3	---	31.6	---	20.1	---	11.5	---	---	---	17.0	---	---	---	---	2.7	---	---
160	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.2	---	---	---	4.0	---	---	---
170	12.0	---	---	---	3.6	---	8.5	---	9.6	---	---	---	---	---	---	5.4	5.7	---	---	---	3.1	---	---	---
180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.3	5.8	---	---	---	3.2	---	---	---
190	21.0	---	---	---	4.2	---	---	---	---	---	---	---	---	---	---	8.1	9.2	---	---	---	5.5	---	---	---
21	30.5	---	3.7	---	6.9	24.8	---	---	26.5	---	23.4	11.0	---	19.7	---	---	---	---	---	8.5	---	2.7	---	---
24	---	4.2	---	6.7	---	---	---	---	26.2	---	23.4	---	---	---	---	---	---	---	---	---	---	---	---	37.8
25(A)10	4.6	---	---	---	1.2	---	3.6	---	4.3	---	---	---	---	---	---	1.9	2.2	---	---	---	1.0	---	4.2	---
25(B)10	5.1	---	---	---	1.4	---	4.3	---	4.8	---	---	---	---	---	---	1.9	2.2	---	---	---	1.1	---	4.8	---
29	---	3.7	---	5.6	---	---	---	---	26.0	---	23.0	---	---	---	---	19.0	15.0	---	---	---	---	---	---	---
31	3.3	---	3.6	---	7.2	---	24.0	---	26.0	---	22.6	---	11.6	---	---	20.0	15.0	---	---	---	---	2.5	---	37.5
320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.1	---	---	---
34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
350	5.6	---	---	---	1.4	---	4.2	---	4.7	---	---	---	---	---	---	2.1	2.4	---	---	---	---	---	47.4	---
360	5.5	---	---	---	1.6	---	4.4	---	5.1	---	---	---	---	---	---	---	2.7	---	---	---	1.9	---	---	---
370	6.4	---	---	---	1.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
380	6.0	---	---	---	1.9	5.6	---	---	---	---	---	---	---	---	---	3.2	3.6	---	---	---	2.0	---	---	---
39	---	---	---	---	---	---	24.4	---	27.0	---	23.5	---	---	---	---	---	16.9	---	---	---	---	2.4	---	---

TABLE AVII cont.

Serial #	20L	21L	22L	23L	24L	25L	26	27	28L	29L	30L	31L	41L
400	11.0	---	---	8.0	---	9.0	---	---	---	5.5	---	3.4	---
41	---	---	---	---	---	---	---	---	---	---	---	---	12.0
42	31.3	4.0	6.2	25.0	---	27.2	24.1	11.3	12.0	20.5	---	8.6	37.3
43	30.7	3.6	6.6	22.7	---	25.6	22.1	---	---	20.3	---	---	---
44	34.5	---	8.2	---	---	30.0	---	---	---	---	---	---	---
45	6.2	---	1.5	4.7	---	5.6	---	---	---	2.4	---	1.5	5.9
47	---	---	---	---	---	---	---	---	---	---	---	---	---
48	31.6	---	6.5	---	---	---	---	---	---	---	---	---	---
49	7.2	---	2.5	5.6	---	7.0	---	---	---	3.3	---	---	---
50	---	---	---	---	---	---	---	---	---	---	---	---	---
52	6.9	---	2.0	5.7	---	6.7	---	---	---	3.1	---	2.0	6.7
54	---	---	3.0	10.1	---	11.5	---	---	---	5.7	---	3.9	---
55	32.7	---	---	26.0	---	27.7	---	---	---	---	---	---	---
Mixed	---	---	---	---	---	---	---	---	---	---	---	---	---
56	11.2	---	3.0	8.0	---	9.9	---	---	---	---	---	3.4	---
57	19.3	---	3.0	15.4	---	16.5	---	---	---	8.2	---	5.5	---
58	---	---	---	---	---	---	---	---	---	---	---	---	---
59	12.1	---	3.3	---	10.4	---	---	---	---	5.6	---	3.8	---
60	---	---	---	---	---	---	---	---	---	---	---	---	---
61	30.9	4.9	7.0	20.0	---	31.9	20.1	---	---	24.6	10.2	2.0	45.8

TABLE AVII CONT.

Serial #	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
65	34.0	4.2	6.0	26.1	28.2	24.0	13.0	11.7	21.6	17.5	8.5	2.5	40.6																		
66	31.0	4.1	6.4	24.2	26.9	23.5	12.4	12.4	21.6	14.0	2.5	36.1																			
67	30.5	4.0	6.7	25.0	28.4	26.3	12.4	12.4	21.6	16.3	9.0	2.6	38.7																		
68	30.5	4.5	8.6	27.4	28.6	26.1	10.6	11.8	21.5	16.3	9.7	3.2																			
69	31.5	4.1	7.1	25.6	27.2	24.4	10.0	11.2	19.9	15.2	8.7	2.4	36.2																		
70	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
71	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
72	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
73	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
74	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
75	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
76	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
77	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
78	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
79	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
80	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
81	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
82	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
83	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
84	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
85	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
86	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
87	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
88	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
89	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			
90	34.5	4.4	7.9	26.0	28.2	24.0	11.2	11.2	21.6	15.5	2.9	40.0																			

TABLE AVII cont.

Serial #	20L	210	21L	220	22L	230	23L	240	24L	250	25L	260	270	280	28L	290	29L	300	30L	40L	410	41L
910	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
92	34.2	---	4.4	---	0.3	---	---	---	27.2	---	23.5	10.3	10.7	---	20.6	---	15.4	---	0.6	2.5	---	30.0
93	31.3	---	3.0	---	0.5	---	---	---	27.0	---	23.5	10.3	11.1	---	19.0	---	14.5	---	7.9	2.1	---	30.6
94	29.1	---	4.0	---	7.5	---	---	---	26.7	---	---	---	10.9	---	20.0	---	14.7	---	0.2	2.5	---	---
95	30.1	---	3.9	---	6.0	---	---	---	25.5	---	22.6	---	---	---	---	---	---	---	---	2.2	---	---
96	33.2	---	---	---	6.9	---	---	---	---	---	---	---	---	---	21.5	---	---	---	8.9	---	---	---
97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	21.4	---	---	---	---	2.8	---	---
1000	21.9	---	---	---	4.9	---	18.9	---	---	---	---	---	---	---	10.0	---	11.0	---	6.3	---	---	---
1010	26.6	---	---	---	---	---	20.4	---	22.3	---	---	---	---	---	11.2	---	12.7	---	7.2	---	---	---
102	29.6	---	---	---	6.5	22.2	---	---	---	---	21.5	---	---	---	---	---	---	---	---	2.5	---	---
103	29.2	---	3.9	---	6.8	---	23.3	---	25.2	---	22.3	11.8	9.8	---	17.9	---	13.3	---	---	2.3	35.2	---
1040	23.0	---	---	---	4.9	---	17.6	---	19.6	---	---	---	---	---	9.7	---	10.3	---	6.3	---	26.3	---
1050	8.0	---	---	---	2.5	---	---	---	7.1	---	---	---	---	---	3.6	---	3.8	---	2.1	---	---	---
1060	6.0	---	---	---	2.0	---	5.6	---	6.4	---	---	---	---	---	3.2	---	3.4	---	2.0	---	---	6.5
1070	7.3	---	---	---	2.2	---	6.1	---	6.8	---	---	---	---	---	---	---	---	---	---	---	---	---
1080	10.4	---	---	---	3.0	---	---	---	---	---	---	---	---	---	4.8	---	5.3	---	3.1	---	---	---
1090	5.6	---	---	---	1.5	---	4.6	---	5.2	---	---	---	---	---	2.7	---	3.0	---	1.3	---	5.3	---
1100	6.9	---	---	---	2.0	---	5.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1110	11.3	---	---	---	3.4	---	8.9	---	---	---	---	---	---	---	5.5	---	5.9	---	3.7	---	---	11.5
1120	7.6	---	---	---	2.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1140	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.3	---

TABLE AVII cont.

Barrel #	31R	31L	32R	32L	33R	33L	34R	34L	35R	35L	36R	36L	37R	37L	38R	38L	39R	39L	40R
10	8.0	7.8	55.0	54.0	54.0	54.0	5.6	5.6	9.9	10.0	3.2	3.1	3.1	3.2	43.0	43.3	3.9	4.2	3.1
14	---	---	---	46.5	---	46.0	---	4.5	---	8.2	---	2.3	---	3.1	39.7	---	2.9	---	2.5
15	---	---	55.6	---	55.4	---	4.9	---	9.7	---	2.7	---	3.3	---	---	49.3	---	3.9	---
160	---	3.3	---	16.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
170	---	2.8	---	15.0	---	---	---	---	---	3.9	---	---	---	---	---	12.5	---	---	---
180	---	3.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
190	---	4.4	30.0	---	---	---	---	---	5.3	---	---	---	---	---	25.0	---	---	---	---
21	8.2	---	---	---	---	---	---	4.2	---	9.0	---	2.8	---	3.1	---	---	---	3.4	---
24	---	---	---	47.2	---	46.9	---	---	---	8.7	---	2.6	---	3.0	---	39.3	---	3.8	---
25(A)0	---	---	---	5.1	---	---	---	---	---	1.4	---	---	---	---	---	4.5	---	---	---
25(B)0	---	---	---	5.5	---	---	---	---	---	1.5	---	---	---	---	---	4.9	---	---	---
29	---	---	---	---	---	---	4.0	---	7.3	---	2.1	---	2.4	---	---	---	---	2.7	---
31	---	---	---	45.3	---	44.9	---	4.2	---	9.5	---	2.7	---	2.8	---	39.3	---	3.5	---
330	---	2.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
350	---	---	---	5.4	---	---	---	---	---	1.7	---	---	---	---	---	4.8	---	---	---
360	---	---	---	6.0	---	---	---	---	---	1.9	---	---	---	---	---	5.4	---	---	---
370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
380	---	1.7	---	7.8	---	---	---	---	---	2.2	---	---	---	---	---	---	---	---	---
39	---	---	---	---	---	---	---	4.2	---	---	---	2.5	---	2.9	---	---	---	3.1	---

TABLE AVII cont.

Serial #	31R	31L	32R	32L	33R	33L	34R	34L	35R	35L	36R	36L	37R	37L	38R	38L	39R	39L	40R
400	----	2.8	----	15.3	----	----	----	----	----	4.0	----	----	----	----	----	12.2	----	----	----
41	----	----	----	----	----	----	----	----	----	----	----	2.8	----	3.3	----	----	----	3.3	----
42	----	----	----	45.9	----	45.6	----	4.5	----	8.5	----	2.5	----	2.8	----	38.6	----	3.2	----
43	----	----	----	45.0	----	44.5	----	4.4	----	9.0	----	2.4	----	3.1	----	37.4	----	3.7	----
44	----	----	----	----	----	----	----	----	----	10.9	----	3.2	----	3.8	----	----	----	4.0	----
450	----	----	----	7.2	----	----	----	----	----	1.9	----	----	----	----	----	6.1	----	----	----
47	----	----	----	----	----	----	----	4.3	----	8.5	----	2.6	----	2.8	----	38.6	----	3.4	----
480	----	----	----	45.6	----	----	----	----	----	8.8	----	----	----	----	----	----	----	----	----
490	----	----	----	8.4	----	----	----	----	----	2.8	----	----	----	----	----	7.2	----	----	----
500	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
520	----	1.7	----	8.1	----	----	----	----	----	2.5	----	----	----	----	----	7.2	----	----	----
540	----	3.2	----	16.3	----	----	----	----	----	4.4	----	----	----	----	----	13.9	----	----	----
550 Mixed	----	----	45.0	----	----	----	----	5.0	----	8.9	----	----	----	----	----	40.6	----	----	----
560	----	2.7	----	13.7	----	----	----	----	----	3.1	----	----	----	----	----	11.4	----	----	----
570	----	4.8	----	27.1	----	----	----	----	----	5.0	----	----	----	----	----	23.0	----	----	----
58	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
590	----	3.1	----	15.1	----	----	----	----	----	3.6	----	----	----	----	12.5	----	----	----	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
61	----	----	----	54.8	----	54.4	----	5.4	----	10.5	----	3.0	----	3.5	----	46.4	----	4.2	----

TABLE AVII cont.

Burial #	31R	31L	32R	32L	33R	33L	34R	34L	35R	35L	36R	36L	37R	37L	38R	38L	39R	39L	40R
65	---	8.3	---	50.3	---	49.3	---	4.6	---	8.6	---	2.7	---	2.9	---	41.2	---	3.1	---
66	---	8.9	---	---	---	---	---	---	---	---	---	2.9	---	2.7	---	37.8	---	3.3	---
67	---	---	---	48.5	---	47.6	---	4.5	---	8.7	---	2.7	---	3.0	---	41.5	---	3.8	---
68	---	6.4	Aspt. 27.0	50.6	---	50.1	51.4	5.1	---	10.0	2.9	3.0	3.5	3.4	---	41.6	---	4.5	---
69	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
70	---	8.0	---	44.4	---	44.0	---	4.5	---	8.8	---	2.6	---	3.4	---	37.9	---	3.4	---
77	---	---	---	48.8	---	48.2	---	5.0	---	9.0	---	2.9	---	3.4	---	42.1	---	3.8	---
78D	---	5.5	26.1	---	25.7	---	---	---	5.7	---	---	---	---	---	---	---	---	---	---
79	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
80D	---	---	---	7.3	---	---	---	---	---	2.0	---	---	---	---	---	6.3	---	---	---
81	7.3	---	---	48.1	---	47.4	---	4.3	---	8.7	---	2.8	---	2.6	---	39.5	---	3.3	---
82	---	---	---	52.8	---	52.4	---	4.8	---	9.0	---	2.6	---	3.1	---	45.0	---	3.8	---
83D	---	5.9	---	33.0	---	---	---	---	---	6.3	---	---	---	---	---	28.0	---	---	---
84	---	---	37.8	---	---	---	---	---	7.0	---	---	---	---	---	---	31.8	---	---	---
85	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
86	---	---	---	46.2	---	45.5	---	4.6	---	9.0	---	2.8	---	3.3	---	38.5	---	3.5	---
87	---	---	---	52.0	---	51.8	---	---	---	8.8	---	3.0	---	3.5	---	44.4	---	3.5	---
88D	---	4.0	---	22.6	---	---	---	---	---	4.8	---	---	---	---	---	18.8	---	---	---
89	7.4	---	---	47.4	---	46.7	---	5.2	---	9.3	---	3.0	---	3.1	---	40.2	---	3.9	---

TABLE AVII cont.

Burial #	31R	31L	32R	32L	33R	33L	34R	34L	35R	35L	36R	36L	37R	37L	38R	38L	39R	39L	40R
90	----	----	----	----	----	----	4.8	----	9.1	----	2.8	----	3.1	----	----	----	3.4	----	2.8
910	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
92	----	7.1	----	47.9	----	47.7	----	4.9	----	8.7	----	2.5	----	3.6	----	40.3	----	3.6	----
93	----	7.4	----	48.0	----	47.4	----	4.1	----	8.8	----	2.7	----	2.7	----	39.8	----	3.2	----
94	----	7.3	----	42.0	----	41.8	----	4.1	----	8.0	----	2.6	----	2.7	----	36.8	----	3.4	----
95	----	----	----	----	----	----	----	4.3	----	----	----	2.8	----	2.5	----	----	----	3.1	----
96	----	----	----	----	----	----	----	4.6	----	----	----	2.7	----	3.3	37.0	----	3.7	----	2.5
97	----	----	----	50.0	----	49.7	----	----	----	9.8	----	3.0	----	3.8	----	43.9	----	3.8	----
1000	----	5.8	----	31.9	----	----	----	----	----	6.4	----	----	----	----	----	26.4	----	----	----
1010	----	5.8	----	37.8	----	----	----	----	----	7.7	----	----	----	----	----	31.5	----	----	----
102	----	----	----	40.2	----	40.0	----	4.0	----	8.5	----	2.6	----	3.1	----	34.6	----	3.1	----
103	----	----	----	42.9	----	42.2	----	4.2	----	8.5	----	2.7	----	2.8	----	36.3	----	3.1	----
1040	----	5.7	----	----	----	----	----	----	----	----	----	----	----	----	----	26.8	----	----	----
1050	----	1.8	----	8.9	----	----	----	----	----	2.7	----	----	----	----	----	8.3	----	----	----
1060	----	1.9	----	7.8	----	----	----	----	----	2.0	----	----	----	----	----	6.9	----	----	----
1070	----	----	----	8.9	----	----	----	----	----	2.4	----	----	----	----	----	7.5	----	----	----
1080	----	2.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1090	----	1.3	----	6.5	----	----	----	----	----	1.9	----	----	----	----	----	5.7	----	----	----
1100	----	----	----	8.1	----	----	----	----	----	2.3	----	----	----	----	7.1	----	----	----	----
1110	----	3.5	----	14.4	----	----	----	----	----	3.5	----	----	----	----	12.1	----	----	----	----
1120	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1140	----	----	----	12.2	----	----	----	----	----	3.0	----	----	----	----	----	----	----	----	----

TABLE AVIII
 Caries Prevalence for Permanent Dentition
 MAXILLARY TEETH

Burial #	Tooth #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	2,3	3	3	3	3	3	1	1	1	1	1	1	1	3	3	2	1
15	1	1	1	3	3	1	1	1	1	1	1	1	1	4	4	4	1
19	9	9	1	9	9	9	9	9	1	1	9	9	9	9	1	9	9
21	9	9	3,4	3,4	1	1	1	1	9	1	1	1	9	1	9	9	9
24	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
31	2	1	1	1	1	1	1	1	9	1	9	1	1	1	2	1	2
39	9	9	9	9	9	9	9	9	9	9	1	1	9	9	9	9	9
41	9	9	9	9	9	9	9	9	9	9	1	1	9	9	9	9	9
42	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
43	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
44	1	1	1	1	1	3	1	1	1	1	1	3	2	3	9	1	1
47	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
48	1	1	1	1	1	1	9	9	1	1	1	9	1	1	1	1	1
55	1	1	3	1	1	1	1	1	3	1	1	1	1	1	2,3	2	2
57	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	9

TABLE AVIII cont.
MAMMARY TEETH

Teeth #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
61	9	1	2	1	9	9	1	9	3,3	3	9	9	1	3	9	9
65	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
66	9	9	9	9	9	9	9	9	9	2	9	9	9	9	3,3	9
67	1	1	1	1	1	1	1	1	1	1	1	1	1	9	2	1
68	1	1	1	1	1	1	9	9	1	1	1	1	1	1	1	1
70	2	3	2	9	1	1	1	1	9	2	1	9	1	9	3	9
77	9	9	1	2	1	1	9	1	1	1	1	1	1	2,2	2	2,2,2
78	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
79	9	9	9	9	9	9	1	9	9	9	9	9	1	1	9	9
81	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
82	9	2	9	2	2	3,3	3	1	1	3,4	4,4	9	9	9	9	9
83	9	9	1	9	9	9	1	1	1	3,3	9	9	9	1	9	9
84	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1
86	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
87	1	2	1	1	1	1	1	1	1	1	1	9	9	9	3	9
88	9	9	1	9	9	9	9	9	9	9	9	9	9	1	9	9
89	2,2	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2
92	2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
93	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
94	9	1	3	1	3	1	9	9	9	1	1	1	1	1	2	9
95	1	1	1	3	3,3	3	1	3	3	3	3,3	3	9	3	1	2
96	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9
100	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
101	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
102	9	9	9	9	9	9	9	9	1	9	3	9	9	9	9	9
103	9	9	9	9	9	9	9	1	1	1	1	9	9	9	9	9
104	9	9	9	9	9	9	9	1	1	1	1	9	9	9	9	9

TABLE AVIII cont.
MANDIBULAR TEETH

Burial #	Tooth #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
10	1	2	2,3	1	1	1	1	1	1	1	1	1	1	4	9	4,4,3,2	1
14	1	9	2	1	1	1	1	1	1	1	1	1	1	1	1	1	9
15	9	3	3	3	1	1	1	1	1	5La	1	1	4	9	4,4	2,2,4	1
19	9	9	9	9	9	9	9	1	1	1	1	9	9	9	9	9	9
21	2,3	3	3	1	1	1	1	1	1	1	1	1	9	9	2	2,2	3,4La
24	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
29	1	2	2	1	1	1	1	1	1	1	1	1	1	9	9	9	1
31	1	1	2	1	1	1	1	9	9	1	1	1	1	1	2,2	1	2
39	2,2	1	9	1	1	1	1	1	1	1	1	1	1	1	2	1	2
41	9	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
42	1	1	3	3	1	1	9	9	9	9	9	9	9	3	3	1	1
43	9	9	9	9	1	1	9	9	9	9	9	9	9	9	9	9	9
44	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
47	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2
48	1	2,2,2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
55	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
57	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
61	9	1	1	1	1	1	1	1	1	9	1	1	2	1	9	2	9
65	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2,2,2

TABLE AVIII cont.
MANDIBULAR TEETH

Burial #	Tooth #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
66	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
67	9	9	9	9	1	1	1	1	1	1	1	1	1	9	9	9	9
68	1	4La	2	1	1	1	1	1	9	9	1	1	58	1	2	1	1
70	9	1	9	9	9	1	1	1	1	1	1	1	1	9	9	1	9
77	9	2,2	2,2	3	3	3	1	1	1	1	1	1	1	1	2,2	2,2,2,2	2
78	9	9	1	9	9	9	9	9	9	9	9	9	9	9	1	9	9
79	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
81	1	1	2	1	1	1	1	1	1	1	1	1	1	2,2,3	1	1	1
82	9	9	9	9	9	3,4	3,4	9	9	1	9	1	3,4,4	9	9	3,3	2
83	9	1	1	1	9	9	9	1	1	1	1	9	9	9	1	9	9
84	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
86	1	2	9	3	3	1	1	1	1	1	1	1	1	1	9	3	2
87	2	9	2	58	58	58	1	1	9	9	1	1	1	1	9	9	1
88	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
89	2,2	2	9	9	1	1	1	1	1	1	1	1	1	1	9	1	9
92	1	2	1	1	1	1	1	1	1	1	9	2	1	1	1	2	2,2,2
93	9	9	9	9	1	1	1	1	1	1	1	1	1	3	9	9	9
94	9	2	2	1	1	1	1	1	1	1	1	1	1	1	1	9	9
95	2	2	9	9	1	1	1	1	1	1	1	9	9	9	9	5L1	1

TABLE AVIII cont.

Burial #	Tooth #	MANDIBULAR TEETH															
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
96	9	9	9	9	9	1	1	9	1	1	9	1	1	9	9	9	9
100	9	1	1	1	9	9	1	1	1	1	1	1	9	9	1	1	9
101	9	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	9
102	9	9	9	9	3	9	2	1	1	1	1	1	1	9	9	9	9
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
104	9	9	1	1	9	9	9	9	9	1	9	9	9	9	9	9	9

Key: Caries Presence and Location

- 1 - None
- 2 - Pit and fissure
- 3 - Interproximal
- 4 - Cervical
- 5 - Smooth surface (8- buccal; La - labial; Li - lingual)
- 6 - Root
- 9 - Unobservable

TABLE AIX

Caries Prevalence for Deciduous Dentition (completely erupted)

Burial #	Tooth #		MAXILLARY									MANDIBULAR								
	4	5	6	7	8	9	10	11	12	13	20	21	22	23	24	25	26	27	28	29
16	1	1	1	9	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1
17	9	1	9		1	9	9	9	1	9		9	9	9	1	1	9	9	9	9
18	9	1	9	1	9	1	1	9	1	9		9	9	9	9	1	9	9	9	9
19	1	1	1	1	1	1	1	1	1	2,2		2,2,2	1	58	9	9	9	58	2	2
33	9	1	1	1	1	1	1	1	1	9		9	1	9	1	1	1	1	1	9
40	9	9	9	1	1	1	1	9	9	9		9	9	9	1	1	1	9	9	9
54	9	1	9	9	1	1	9	9	1	9		9	9	9	1	1	1	9	9	9
57	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	3
59	9	1	9	1	1	1	1	9	1	9		9	1	9	1	1	1	9	1	9
69	9	1	1	1	1	1	1	1	1	9		9	1	9	1	1	1	9	1	9
78	1	1	1	1	1	1	1	1	1	1		1	1	9	1	1	1	1	1	1
83	2,2	1	2	9	9	9	9	1	1	1		2,3	3	1	9	9	9	1	3	2,3
85	9	9	9	1	1	1	1	9	9	9		9	9	9	9	9	9	9	9	9
88	1	1	1	1	1	9	1	1	1	1		1	1	1	1	1	1	1	1	1
100	1	1	1	9	9	9	9	1	1	1		1	1	9	9	9	9	9	9	1
104	9	9	9	9	9	9	1	9	9	1		1	1	9	9	9	9	9	9	9

TABLE AIX cont.

Burial #	Tooth #	MAXILLARY										MANDIBULAR									
		4	5	6	7	8	9	10	11	12	13	20	21	22	23	24	25	26	27	28	29
108	9	9	9	9	9	1	1	9	9	9	9	9	9	9	9	1	1	9	9	9	9
111	9	9	9	9	9	9	9	9	9	9	9	9	1	9	1	1	1	1	9	1	9
114	1	1	9	1	9	1	9	1	9	1	9	9	9	9	9	1	1	9	9	9	9

Key:

- 1 - None
- 2 - Pit and fissure
- 3 - Interproximal
- 4 - Cervical
- 5 - Smooth surface (8 - buccal surface; La - labial; Ll - lingual)
- 6 - Root
- 9 - Unobservable, primarily due to incomplete or uneruption

TABLE AX

Permanent Dental Abscessing From Observable Alveolar Bone

Burl #	Tooth #		MAXILLARY										MANDIBULAR										TEETH										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
29	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
33	9	9	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
39	1	1	1	1	9	1	1	9	9	9	1	1	1	9	1	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	1	9
42	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
43	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	9	9	9	
44	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
47	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1
55	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
61	9	9	9	9	9	9	9	9	9	9	9	3	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	3	1
65	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TABLE AX cont.

Burial #	Tooth #		MAXILLARY TEETH										MANDIBULAR TEETH																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
66	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	3	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
67	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	1	1	9	9	9	3	1	1	1	1	1	1	1	1	1	9	9	9
68	1	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	3	1	1	1	1	1	1	1
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1
77	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
81	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
82	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
83	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	1	9	9	1	1	1	1	1	1	9	9	9	9	9
84	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
86	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
87	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
92	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
93	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
94	1	1	1	1	1	1	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
96	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	9	9	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	1	1	1	1	1	1	9	9	1	9	9
101	9	1	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	1	1	1	1	1	1	1	1	9	1	1	1	1
102	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
103	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Key: Abscess Presence and Size

- 1 - None
- 2 - Small: 1 to 3 mm diameter
- 3 - Medium: 3 to 5 mm diameter
- 4 - Large: larger than 5 mm diameter
- 9 - Unobservable: primarily from absent alveolar bone

Deciduous Dental Abscessing From Observable Alveolar Bone

Serial #	MAXILLARY TEETH										MANDIBULAR TEETH									
	4	5	6	7	8	9	10	11	12	13	20	21	22	23	24	25	26	27	28	29
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	9	1	9	1	1	9	9	9	1	9	9	9	9	9	1	1	9	9	9	9
18	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9
19	1	1	1	1	9	9	1	1	1	1	1	1	1	9	9	9	9	1	1	1
33	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	9	9
40	9	9	9	1	1	1	1	9	9	9	9	9	9	1	1	1	1	9	9	9
54	9	1	9	9	1	1	4	9	1	9	9	1	9	9	1	1	1	9	1	9
57	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	9	1	1	1
59	9	1	9	1	1	1	1	9	1	9	9	1	9	1	1	1	1	9	1	9
69	9	1	1	1	1	1	1	1	1	9	9	1	9	1	1	1	1	9	1	9
78	1	1	1	1	1	1	1	1	1	1	1	1	1	9	1	1	9	1	1	1
83	9	9	9	9	9	9	9	9	9	9	1	1	1	9	9	9	9	1	1	1
88	1	1	1	1	1	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	9	9	9	9	1	1	1	1	1	9	9	9	9	9	1	9	9
104	9	9	9	9	9	9	9	1	9	1	1	1	9	9	9	9	9	1	1	1
108	9	9	9	9	1	1	9	9	9	9	9	9	9	9	1	1	9	9	9	9
111	9	9	9	9	9	9	9	9	9	9	9	1	9	1	1	1	1	9	1	9
114	1	1	9	1	9	1	1	9	1	9	9	9	9	9	1	1	9	9	9	9

Key: Abscess Presence and Size

- 1 - None
- 2 - Small: 1 to 3 mm diameter
- 3 - Medium: 3 to 5 mm diameter
- 4 - Large: larger than 5 mm diameter
- 9 - Unobservable: primarily due to incomplete or unerupted dentition

TABLE AXII
Calculus Scores for Permanent Dentition (By Tooth)

Burial #	Tooth #		MAXILLARY TEETH												MANDIBULAR TEETH																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
10	3	4	3	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		
14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9	2	2	2	2	2	2	2	2	2	2	2	4	4	9		
15	4	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	9	2	9	1	1	1	1	1	1	1	1	1	1	2	3	4	4	
19	9	9	1	9	9	9	1	1	9	9	9	9	9	9	9	9	9	9	1	9	9	1	1	1	1	1	1	9	9	1	9	9		
21	9	9	4	9	4	4	4	9	4	2	3	9	3	9	9	9	4	4	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
24	4	3	4	4	4	3	4	3	3	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
29	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	9	9	4	4	
31	3	3	4	4	3	3	3	9	2	9	4	4	4	4	4	4	4	4	4	4	4	4	9	9	4	4	4	4	4	4	4	4	4	
39	4	4	4	4	9	4	4	9	9	9	4	4	4	9	4	9	4	4	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
41	9	9	9	9	9	9	9	9	9	4	4	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
42	9	5	9	9	9	9	9	9	9	9	9	9	9	9	9	9	4	4	4	4	4	9	9	9	9	9	9	9	4	4	4	4	4	
43	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	4	9	9	9	9	9	9	9	9	9	9	9	9	9	
44	4	4	4	4	4	4	4	4	4	4	4	4	4	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
47	3	3	3	4	4	4	1	1	1	1	3	4	4	4	4	3	2	4	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	2
48	1	2	4	4	4	3	4	3	2	4	9	4	4	4	4	2	1	4	4	1	2	2	4	4	4	4	4	2	2	4	4	4	4	9
55	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
57	9	9	1	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	

TABLE AXII cont.

TABLE VIII CONT.																																			
Tooth #		MAXILLARY TEETH												MANDIBULAR TEETH																					
Burial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32			
61	9	4	9	4	9	9	4	9	4	4	4	9	2	4	9	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9			
65	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	1	3	1	1	1	1	1	1	1	1	1	3	1	1	3	2	1		
66	9	9	9	9	9	9	9	9	9	9	9	9	9	9	2	9	9	9	9	3	9	9	9	9	9	9	9	9	9	9	9	9	9		
67	4	4	4	4	4	4	4	4	2	2	2	2	4	9	4	4	9	9	9	4	4	4	4	4	4	4	4	4	9	9	9	9	9		
68	4	4	4	4	4	4	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9	9	4	4	4	4	4	4	4	4	4		
70	9	4	4	9	4	4	3	4	9	9	4	9	4	9	4	9	9	4	9	9	2	4	4	4	4	4	4	2	9	9	4	9	4	9	
77	2	3	3	4	4	4	9	1	1	4	3	3	3	3	3	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2		
78	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	9	9	1	9	9	9		
79	9	9	9	9	9	9	9	4	9	9	9	9	4	4	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
81	9	4	4	2	2	3	1	1	1	1	2	3	3	4	4	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9	9	
82	9	9	9	2	2	2	4	4	2	2	2	2	9	9	9	9	9	9	9	9	4	4	9	9	4	9	4	4	9	9	9	9	9	9	
83	9	9	1	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9	1	9	9	9	1	1	1	1	1	9	9	9	1	1	1	1	
84	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	
86	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
87	4	4	4	4	4	4	4	4	4	4	4	4	9	9	4	9	4	9	4	4	4	4	4	9	9	4	4	4	4	4	9	9	4	4	
88	9	9	1	9	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
89	3	3	3	3	4	4	4	4	4	4	4	4	4	4	3	3	3	4	4	9	4	4	4	4	4	4	4	4	4	4	9	4	9	4	9
92	3	4	4	1	1	1	1	1	1	1	1	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
93	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	1	1	1	1	1	1	1	2	2	9	9	9	9	9	

TABLE AXII cont.

TABLE XVII cont.																																		
Burrlet #	Tooth #	MAXILLARY TEETH												MANDIBULAR TEETH																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
94	9	4	4	4	4	4	9	9	9	4	4	4	4	4	4	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9	9	
95	3	4	4	4	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
96	9	9	9	9	9	9	9	9	9	9	1	9	9	9	9	9	9	9	9	9	4	4	9	4	4	4	4	9	4	4	9	9	9	
100	9	1	4	9	9	9	1	1	1	1	9	9	9	4	1	9	9	1	1	9	9	1	1	1	1	1	1	1	1	9	9	1	1	9
101	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
102	9	9	9	9	9	9	9	9	1	9	1	9	9	9	9	9	9	9	9	9	3	9	3	3	3	4	4	3	3	9	9	9	9	9
103	1	3	4	4	4	4	9	4	4	4	4	4	4	4	4	4	4	4	4	2	3	4	4	4	9	2	2	4	3	3	4	4	4	4
104	9	9	9	9	9	9	9	9	1	1	1	9	9	1	9	9	9	9	9	1	9	9	9	9	9	9	1	9	9	9	9	9	9	9

Key: Calculus Deposit

- 1 - None
2 - Slight: discrete areas
3 - Moderate: coalesced areas
4 - Heavy: three-dimensional deposits
9 - Unobservable

TABLE 1

Calculus Scores for Deciduous Dentition (By Tooth)

Burial #	Tooth #		MAXILLARY TEETH										MANDIBULAR TEETH									
	4	5	6	7	8	9	10	11	12	13	20	21	22	23	24	25	26	27	28	29		
16	1	1	1	1	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
17	9	1	9	1	1	1	9	9	1	9	9	9	9	9	1	1	9	9	9	9		
18	9	1	9	1	9	1	1	9	1	9	9	9	9	9	9	1	9	9	9	9		
19	1	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1		
33	9	1	1	1	1	1	1	1	1	9	9	1	9	1	1	1	1	1	1	9		
34	9	9	9	1	1	1	9	1	9	9	9	9	9	9	9	9	9	9	9	9		
40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
54	9	1	9	9	1	1	1	9	1	9	9	9	9	9	1	1	1	9	9	9		
57	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
59	9	1	9	1	9	1	1	9	1	9	9	9	9	1	1	1	1	9	9	9		
69	9	1	1	1	1	1	1	1	1	9	9	1	1	1	1	1	1	1	1	9		
78	1	1	1	1	1	1	1	1	1	1	1	1	9	1	1	9	9	1	1	1		
83	3	1	1	1	9	9	9	1	1	3	1	1	1	1	9	9	9	1	1	1		
85	9	9	1	1	1	1	1	1	9	9	9	9	1	1	1	1	1	1	9	9		
89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
100	4	3	4	9	9	9	9	4	3	4	1	1	9	9	9	9	9	9	9	1		
104	9	9	9	9	9	9	9	1	9	1	1	1	9	9	9	9	9	9	9	9		
108	9	9	9	9	2	2	9	9	9	9	9	9	9	9	1	1	9	9	9	9		
111	9	9	9	9	9	9	9	9	9	9	9	1	9	9	1	1	1	9	1	9		
114	1	1	9	1	9	1	9	1	1	9	9	9	9	9	1	1	9	9	9	9		

Key: Calculus Deposit

- 1 - None
- 2 - Slight: discrete areas
- 3 - Moderate: coalesced areas
- 4 - Heavy: three-dimensional areas
- 9 - Unobservable

TABLE AXIV
Cedar Grove Historic Cemetery Mortuary Components

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
10	A	2		2				2			3	20					
	B									1	1	3	3				
	C	1		1								5					
	D	1									1	10					
	E	1		1							1	5					
	Gen.																
14	A		2									26					
	B	1	1						1		2	10					
	C	2								1	1	8					
	D	1						2+				5	1	1	1		
	E	2	1								3	10					
	Gen.																
15	A	2		2	3							30					
	B	1		1	1	1				1		15			1		
	C	1		1								10					
	D	1		1	1							25					
	E	1										10			1		
	Gen.																
16	A								2			7	7				
	B											6					
	C											2	7				
	D											2					
	E											6	2				
	Gen.																
17	A											15	5				
	B											15					
18	A											3	1				
	B											3					
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
19	A B C Gen.										1	10 20 7 5					
21	A B C D E Gen.	1 2 1 1 1 1		2 1 1 1 1				1 1 1	1 1 3	1	1 3 4 3	10 10 10	2 1		1		
24	A B C D E Gen.	2 2	2 1	3 1 1	1 1						3 4 1 1 3	10 6 4 10 5			1 1 1		
25	A B Gen.					1						15 10					
29	A B C D E Gen.	2 1 1 1 1		1 1 1 1					4		1 1 1 1	11 5 2 8	1+				
31	A B C D E Gen.	2 1		3				1 4	1			12 2 1 9 1					

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
33	A								1			7					
	B											13					
	C											6	2				
	D											10	8				
	E											6	1				
	Gen.																
34	A											9	17				
	B																
	C											4					
	D											3					
	E											5					
	F											2					
	Gen.																
35	A											5					
	B											10					
	Gen.																
36	A											5					
	B											10					
	Gen.																
37	A											15					
	B											15					
	Gen.																
38	A											1	4				
	B											10					
	Gen.																
39	A	2		1	1			1+				5		2	1	1	
	B	1		1	1												
	C	1		1	1				1			5					
	D	1		1							1	3		1			
	E	1									2	2	3	1			
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
40	A B C Gen.											15 5 10					
41	A B C D E Gen.	2 1 1 1 1 1		1 1 1 1 1	2 1 1 1					1	1	5 4 6 5 7	1				
42	A B C D E Gen.	2 1 1 1 1	2 1 1 1	1 1 1							1	3 5 3 5 5					
43	A B C D E Gen.	2 1 1 1 1		1 1 1	2 1						1	8 4 2		1			
44	A B C D E Gen.	2 1 1 1 1		2 1 1 1 1							4 1 1 1 2	20 6 8 4 10	2+				
45	A B Gen.											20 5 2	6				

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
47	A	2		2							1	15					
	B	1										10					
	C	1		1							1	10	1				
	D											15					
	E	1		1								10					
Gen.																	
48	A	2		3			1				2	15		2			
	B				1						1	10	2+		2+		
	C	2		1								15					
	D			1							2	15					
	E	1									2	10		1			
Gen.		1													2+		
49	A											25					
	B											30					
	Gen.																
50	A											10					
	B											15					
	Gen.											3					
52	A											4					
	B											2	2+				
	Gen.																
54	A											10					
	B											15		1			
	C											15					
Gen.																	
55	A	2		2								5	2+				
	B	1		1								4	2+				
	C	1		1								6	2+				
	D	1		1								4					
	E	1		1							2		2+				
Gen.																	

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
56	A B Gen.											10 10					3 1
57	A B C Gen.											7 4 5	3 3				
58	A B Gen.											10 10 1					2 1
59	A B C Gen.											5 10 10	2+ 2+ 2+				
60	A B Gen.					1						20 10 2					
61	A B C D E Gen.	2 1 1 1 1		2 1 1 1								5 7 3 6 10		1			
65	A B C D E Gen.	2 1 1 1 1		1								5 4 6 8 3		1			1

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
66	A	1		1								10		1			
	B	1		1	1					1		5					
	C	1										6					
	D	1		1										1			
	E	1										3					
	Gen.																
67	A	1		1				2		1	1	8					
	B	1										5					
	C	2		2	2		1					8	2			2+	
	D	1		1										1		2+	
	E	1												1			
	Gen.													1			
68	A	2					1					2					
	B	1					2			1							
	C	1										3					
	D	1					1					2					
	E	1										2					
	Gen.																
69	A					1						10					
	B											6					
	C											15					
	Gen.																
70	A	1		1			1	6	4		2	10					
	B	1		1					14		3	18	2	1			
	C	1		1					10	1	3	3					
	D	1		1					1		1	10					
	E	1							1			1					
	F	1							2			1				1	
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
77	A			1	2			2+	2			3					
	B			1	1			9	9	1		2					
	C			1	1			2	2			1					
	D			2	1												
	E			1													
	F			1				16	6			6					
	Gen.	6		1				1			5	35	8				5
78	A	2		2	1			2+			2	25	5				
	B	1		1				2+	2		1	1					
	C				1			2+		1	2	4					
	D	1		1	1						3	11	3				
	E	2		1				2+			2	7					
	Gen.											1	1				
	Gen.	1					1		10	1	1	4					
79	Gen.																
80	A											15	6				2
	B											15	4				3
81	Gen.																
	A	2		1							2	15		1			
82	B	1		1						1		5		2			
	C	1		1							1	10					
	D	1			1						1	5					
	E	1									1	5					
	Gen.																
82	A											10					
	B											5					
	C											5					
	D																
	E											10					
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
83	A	2		1							1	6		1			
	B																
	C	1							1	1	3	5					
	D	1		1							1	4		1			
	E	1		1								4					
Gen.																	
84	A	2		3	1							15					
	B	2		1							2	10					
	C	1		1							1	5					
	D	1		1								5					
	E	1		1							1	3		1			
Gen.																	
85	A											20					2
	B											15					1
	C											15					1
Gen.																	
86	A			1							1	10		2			
	B																
Gen.																	
87	A	2															
	B	1										1					
	C	1										2					
	D	1		1													
	E	1		1								2					
Gen.																	
88	A											15					
	B											20					
Gen.																	
89	A	2		2							1	10		2			
	B	1		1								3					
	C	1									3	8					
	D	1									1	10		2			
	E	1		2							1	6					
Gen.																	

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
90	A	1		2							1	10	1				
	B	2		1								3					
	C	1		1								4					
	D	1		1								2					
	E	1		1								3					
Gen.																	
91	A											6					
	B											10					
	C											15					
	D											10					
	E																
Gen.																	
92	A	2		2							2	5					
	B	1		1						1		2					
	C	1		1	1						1	2		1			
	D	1		1							1	3	1	1			
	E	1		1							1	8		1			
Gen.																	
93	A	2		2							1	6		2			
	B	1		1							1	4					
	C	1		1						1		8					
	D	1		1								7		1			
	E	1		1								10		1			
Gen.																	
94	A	2		3			1				2	10		2		1	2
	B	1		1						1		8					1
	C	1		1							1	4					1
	D	1		1							1	4					1
	E	1		1							1	4					
Gen.																	

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
95	A	2		2			1					10		2			
	B	1		2						1		5				1	
	C	1		1							1	3					
	D	1		1								18		1			
	E	1		1							2	4					
	Gen.																
96	A	1		2						1		2	1			1	
	B	1		1								3				1	
	C	1		1								8					
	D	1		1													
	E	2		1	1			2+			1	10					
	Gen.							3			1						
97	A	1									4	11					
	B											4					
	C	2		1				2+	2+	12		6	2	3			
	D	1		1				2+			2	7	2	1			
	E	1		1				2+				6					
	Gen.																
100	A											20					1
	B											6					
	C											9					1
	D											10					1
	E											10		1			
	Gen.																
101	A											15					1
	B											3					1
	C											10					1
	D											10					1
	E											15					1
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
102	A	2		2								10					
	B	1		1	1							8					
	C	1										10	2				
	D			1							1	7		1			
	E	2		1			1					10		1			
	Gen.																
103	A	2		2								10					
	B	1		1							2	3					
	C	1									1	3					
	D	1										3					
	E	1									1	9					
	Gen.																
104	A	2		2	1							10					
	B	1										10					
	C	1										3					
	D	1		1								10					
	E	1		2								10	4				
	Gen.															2+	
105	A											10					
	B											10					
	Gen.											1					
106	A											10					2+
	B											4					6
	Gen.																
107	A											10					
	B											15					
	Gen.																
108	A											15					
	B											10					
	Gen.																

TABLE AXIV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
109	A B Gen.											8					
												9					
110	A B Gen.											8 20 10					
111	A B Gen.											6 10					2
112	A B Gen.								1			20					
114	A B Gen.							1				15 10	10 5				

KEY:

1. Casket Handle
2. Box Receptacle Handle
3. Casket Lid Fastener
4. Receptacle Lid Fastener
5. Iron Band
6. Casket Ornament
7. Unidentified Metal
8. Coffin Wood Fragment

9. Plaque
10. Diamond Tack
11. Nail
12. Lining Tack
13. Screw
14. Corrugated Fastener
15. Viewing Window Glass
16. Decorative Tack

TABLE AXV

Cedar Grove Historic Cemetery Personal Goods

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
10	A		1	1								1											
	B		1																				
	C		1				2														1		
	D																						
	E			1			1																
	Gen.																						
14	A			2																			
	B																						
	C										3												
	D																						
	E								1														
	Gen.																						
15	A		1	1			1													1	1		
	B		1	1								2								2+	2+		
	C		1	1		1					1	1											
	D		1																				
	E		1																				
	Gen.		1	2							1												
16	A																						
	B																						
	C			1																			
	D																						
	E			1																			
	Gen.																						
17	A									1								1					
	B																	1	4				
	Gen.				3																		

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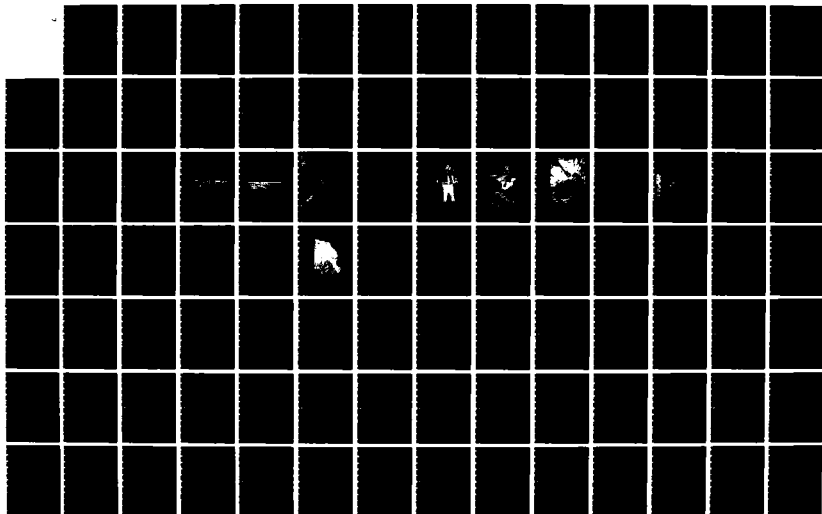
CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY
(U) ARKANSAS ARCHEOLOGICAL SURVEY FAYETTVILLE
J C ROSE 31 OCT 83 COESAV/PD-RC-83-05 DACW29-81-C-0059

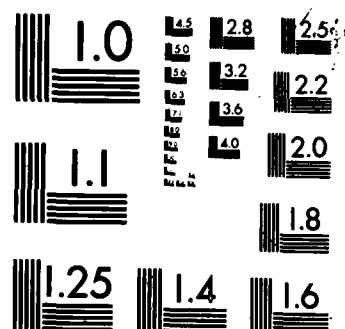
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE AXV cont.

[illegible]

TABLE ANV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
31	A									1													
	B																						
	C																						
	D																						
	E																						
	Gen.																						
33	A				2																		1
	B																						
	C																						
	D																						
	E																						
	Gen.																						
34	A			3						1													
	B																						
	C									1													
	D									1													
	E																						
	F																						
	Gen.																						
35	A			1						2													
	B																						
	Gen.																						
36	A				1				1														
	B																						
	Gen.																						
37	A				2					1													
	B								1	3													
	Gen.																						
38	A									3													
	B																						
	Gen.																						

TABLE AXV CONT.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
39	A		2											1	1	26+					1	1	1
	B				3																		
	C																						
	D																						
	E																						
	Gen.																						
40	A				5					1													
	B																						
	C				1																		
	Gen.																						
41	A					2				1	3		2	1	1								
	B					2																	
	C																						
	D																						
	E																						
	Gen.																						
42	A																						
	B																						
	C									1				1							1		
	D																						
	E									1													
	Gen.																						
43	A			1	1										2	2+							1
	B																						
	C				2																1+		
	D																						
	E																						
	Gen.																						
44	A			3		1			2+		2+												
	B																						
	C			1																			
	D																						
	E		1			3				3													
	Gen.																						

TABLE AXV cont.

[illegible]

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
55	A					1																	
	B									1													
	C																						
	D																						
	E																						
	Gen.																						
56	A			4						1													
	B																						
	Gen.																						
57	A			3	3																		
	B																						
	C																						
	Gen.																						
58	A			7						1													
	B			1						1													
	Gen.																						
59	A			2					1														
	B			1																			
	C																						
	Gen.																						
60	A			3																			
	B			10						3													
	Gen.									1													
61	A			1																			
	B					1																	
	C					1																	
	D																						
	E																						
	Gen.																						

2+

TABLE XV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
65	A													1							1		
	B				3																		
	C																						
	D																						
	E																						
66	Gen.				2																		
	A				1																		
	B						1																
	C																						
	D			1		2+															1		
67	E																						
	Gen.																						
	A																						
	B																						
	C																						
68	D																						
	E																						
	Gen.																						
	A																						
	B																						
69	C																						
	Gen.																						
	A																						
	B																						
	C																						

TABLE AXV cont.

[illegible]

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
82	A			3			7														1		
	B																						
	C			1																			
	D																						
	E																	1					
Gen.																							
	A																						
	B																						
	C			1	1																		
	D																						
	E			2						2+													
Gen.																							
	A				4																1		
	B																						
	C																						
	D																			2			
	E																			2			
Gen.																							
	A																				1		
	B																						
	C																						
	D																						
	E																						
Gen.																							
	A																				2		
	B																						
	C																						
	D																						
	E																						
Gen.																							
	A																						
	B																						
	C																						
	D																						
	E																						
Gen.																							

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
88	A				3																		
	B																						
	Gen.																						
89	A		2																				
	B		1																				
	C		1																				
	D																						
	E																						
	Gen.																						
90	A										1												
	B																						
	C																						
	D					1																	
	E					1																	
	Gen.																						
91	A																						
	B																						
	C																						
	D																						
	Gen.																						
92	A																						
	B																						
	C			1																			
	D			1																			
	E																						
	Gen.																						
93	A																						
	B																						
	C																						
	D																						
	E																						
	Gen.																						

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
94	A			3										1									1	
	B			1										1										
	C																							
	D																							
	E																							
Gen.																								
95	A			1						1+					1									
	B			1																				
	C						3																	
	D																							
	E																							
Gen.																								
96	A						1				1													
	B																							
	C		3																					
	D		1									1												
	E																							
Gen.																								
97	A																							
	B																							
	C																							
	D																							
	E																							
Gen.																								
100	A																							
	B																							
	C																							
	D																							
	E																							
Gen.																								
															10+									

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
101	A																						
	B																						
	C																						
	D																						
	E																						
	Gen.																						
102	A				1																		
	B																						
	C																						
	D																						
	E																						
	Gen.																						
103	A														1								
	B																						
	C																						
	D																						
	E																	1					
	Gen.																	1					
104	A																						
	B																						
	C																						
	D																						
	E																						
	Gen.																						
105	A																						
	B																						
	Gen.																						
106	A																						
	B																						
	Gen.																						

TABLE AXV cont.

Burial #	Sec.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
107	A				10					1											1		
	B																						
	Gen.				1																		
108	A				1					2													
	B				1					2											1		
	Gen.																						
109	A																						
	B			1	1																		
	Gen.				2																		
110	A																						
	B									2													
	Gen.																						
111	A				2																		
	B				1					1											1		
	Gen.				1																		
112	A						1																
	B																						
	Gen.																						
114	A			2	1																		
	B									1													
	Gen.				2																1		

KEY:

1. Glass Button
2. Bone Button
3. Shell Button
4. Porcelain Button
5. Metal Button
6. Synthetic Button
7. Stud
8. Straight Pin
9. Safety Pin
10. Snap Fastener
11. Metal Cuff Link

12. Metal Pin Jewelry
13. Metal Finger Ring
14. Metal Earring
15. Glass Bead
16. Suspender Buckle
17. Shoe Leather Fragment
18. Shoe Nail
19. Eyelet
20. Fabric
21. Dental
22. Comb

TABLE AXVI
Cedar Grove Historic Cemetery Miscellaneous, Prehistoric, and Organic Remains

Burial #	Sec.	1	2	Miscellaneous Goods					7	Prehistoric				11	Organic	
				3	4	5	6			8	9	10			12	13
10	A B C D E Gen.				1											
14	A B C D E Gen.		1													
15	A B C D E Gen.															
16	A B C D E Gen.									1						
17	A B Gen.															

TABLE AXVI cont.

Burial #	Sec.	Miscellaneous Goods					Prehistoric			Organic				
		1	2	3	4	5	6	7	8	9	10	11	12	13
18	A B Gen.													
19	A B C Gen.													
21	A B C D E Gen.		3											
24	A B C D E Gen.													
25	A B Gen.													
29	A B C D E Gen.								2	1				1

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					7	Prehistoric			11	12	13
				3	4	5	6			8	9	10			
31	A B C D E Gen.														
33	A B C D E Gen.	2								1	1				
34	A B C D E F Gen.									2	3				
35	A B Gen.														
36	A B Gen.									1	2				
37	A B Gen.									3					
38	A B Gen.									1	2				

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					7	8	Prehistoric			11	Organic	13
				3	4	5	6				9	10				
39	A B C D E Gen.															
40	A B C Gen.									1 2 2						
41	A B C D E Gen.									2						
42	A B C D E Gen.									2						
43	A B C D E Gen.									1			1			
44	A B C D E Gen.															

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					6	7	Prehistoric			11	12	13
45	A B Gen.															
47	A B C D E Gen.															
48	A B C D E Gen.															
49	A B Gen.															5
50	A B Gen.															
52	A B Gen.															
54	A B C Gen.															

TABLE AXVI cont.

Burial #	Sec.	Miscellaneous Goods					Prehistoric			Organic				
		1	2	3	4	5	6	7	8	9	10	11	12	13
55	A B C D E Gen.			1										
56	A B Gen.													
57	A B C Gen.													
58	A B Gen.													
59	A B C Gen.													
60	A B Gen.													
61	A B C D E Gen.													

TABLE AXVI cont.

Burial #	Sec.	Miscellaneous Goods					Prehistoric			Organic				
		1	2	3	4	5	6	7	8	9	10	11	12	13
65	A													
	B													
	C													
	D													
	E													
	Gen.													
66	A													
	B													
	C													
	D													
	E													
	Gen.													
67	A													
	B													
	C													
	D													
	E													
	Gen.													
68	A													
	B													
	C													
	D													
	E													
	Gen.													
69	A													
	B													
	C													
		Gen.												

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods						Prehistoric			11	12	13
				3	4	5	6	7		8	9	10			
70	A	1													
	B														
	C														
	D														
	E														
	F														
	Gen.														
77	A														
	B														
	C														
	D														
	E														
	F														
	Gen.														
78	A														
	B														
	C														
	D														
	E														
	Gen.														
79	Gen.														
80	A														
	B														
	Gen.														
81	A														
	B														
	C														
	D														
	E														
	Gen.														

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					7	Prehistoric			11	Organic		13
				3	4	5	6			8	9	10		12		
82	A B C D E Gen.															
83	A B C D E Gen.		1													
84	A B C D E Gen.															
85	A B C Gen.															
86	A B Gen.															
87	A B C D E 63n.															

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					6	7	Prehistoric			8	9	10	11	Organic			12	13
88	A B Gen.																					
89	A B C D E Gen.																					
90	A B C D E Gen.																					
91	A B C D Gen.																					
92	A B C D E Gen.																					
93	A B C D E Gen.																					

1+

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					6	7	Prehistoric			11	Organic		13
				3	4	5					8	9	10			12	
94	A B C D E Gen.																
95	A B C D E Gen.																
96	A B C D E Gen.																
97	A B C D E Gen.																
100	A B C D E Gen.																

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods	3	4	5	6	7	8	9	Prehistoric	10	11	Organic	12	13
101	A B C D E Gen.																
102	A B C D E Gen.								1								
103	A B C D E Gen.																
104	A B C D E Gen.																
105	A B Gen.																
106	A B Gen.																

TABLE AXVI cont.

Burial #	Sec.	1	2	Miscellaneous Goods					7	Prehistoric			11	12	13
107	A B Gen.														
108	A B Gen.														
109	A B Gen.														
110	A B Gen.														
111	A B Gen.														
112	A B Gen.														
114	A B Gen.														

491

KEY:

1. Coin
2. Egg Shell
3. Bullet Slug
4. Patent Medicine Bottle
5. Metal Flask
6. Ceramic
7. Metal Lid

8. Aboriginal Ceramic Fragment
9. Chert Flake
10. Antler Projectile Point
11. Mussel Shell
12. Deer Premolar
13. Seed

TABLE AXVII

Molar Attrition Scores (Scott)¹ for Permanent Dentition

Burial #	MAXILLARY TEETH						MANDIBULAR TEETH					
	1	2	3	14	15	16	17	18	19	30	31	32
10	9	10	12	12	10	9	8	9	99	99	10	9
14	4	5	9	8	6	4	4	99	99	99	99	99
15	15	16	19	17	16	4	99	14	99	21	16	13
21	99	99	23	99	99	99	12	13	99	21	18	11
24	10	13	16	14	13	10	10	11	14	14	11	10
29	99	99	99	99	99	99	11	12	10	99	99	13
31	4	7	12	11	8	99	4	8	10	10	8	4
39	99	10	15	99	10	99	4	10	99	16	12	6
42	99	99	99	99	99	99	12	12	13	15	12	12
44	18	20	22	99	20	18	28	26	19	30	22	16
47	8	10	14	14	10	99	8	13	14	14	12	8
48	99	5	9	8	6	99	99	8	9	10	8	99
55	4	10	14	13	8	4	99	8	13	13	8	99
61	99	14	99	12	99	99	99	16	14	99	16	99
65	5	8	9	10	8	5	6	10	11	10	9	5
66	99	99	99	99	12	99	99	99	99	99	99	99
67	99	8	9	99	99	10	99	99	99	99	99	99
68	8	10	17	17	10	8	12	13	15	15	13	10
70	99	10	13	99	10	99	99	14	99	99	14	99
77	5	6	8	8	6	5	6	7	8	8	7	6
79	99	99	99	10	99	99	99	99	99	99	99	99
81	99	4	6	8	5	99	99	5	6	6	5	99
82	99	99	99	99	99	99	99	99	99	99	22	99

Burial #	MAXILLARY TEETH						MANDIBULAR TEETH					
	1	2	3	14	15	16	17	18	19	30	31	32
84	99	4	6	6	4	99	99	5	10	6	5	99
86	11	9	13	99	9	8	10	99	99	99	11	10
87	15	10	12	99	10	99	13	99	99	99	99	13
89	8	10	10	10	10	8	8	10	99	99	10	99
92	9	10	14	14	10	9	9	12	15	14	12	9
94	99	4	24	21	8	99	99	99	99	24	99	99
95	4	6	9	99	6	4	99	6	99	99	6	4
96	99	99	99	99	99	99	99	99	99	99	16	99
100	99	99	4	4	99	99	99	4	8	8	4	99
101	99	4	6	6	4	99	99	4	6	6	4	99
103	99	9	12	12	10	9	9	10	14	14	12	11

Key: Scores represent the summation of the four quadrants of each molar occlusal surface.

99 - Unobservable

1 - after Scott 1979

APPENDIX IV

Administrative Documents

- Item 1 Documentation for Determination of No Adverse Effect,
Field Revetment, Red River, Arkansas. Cedar Grove
Cemetery, 3LA97.
- Item 2 Proposed Mitigation Plan, Cedar Grove Cemetery, 3LA97.
- Item 3 Scope of Services for Data Recovery at Cedar Grove
Cemetery.

DOCUMENTATION FOR DETERMINATION
OF NO ADVERSE EFFECT
FIELD REVETMENT, RED RIVER, ARKANSAS
CEDAR GROVE CEMETERY, 3LA97

I. Agency Involvement

Field Revetment is one construction item within the Red River Emergency Bank Protection Project which was authorized under the Rivers and Harbors Act of 1968, dated 13 August 1968 (Public Law 90-483; House Document No. 304, 90th Congress, Second Session). The project includes multiple work items in the states of Louisiana, Arkansas, Oklahoma and Texas.

II. Project Description

Field Revetment (Figs. 1 and 2) is located in southwest Arkansas, approximately 9.7 km southeast of Garland City in Fayette County. The work item stabilizes 1.7 km of the left descending bank of the Red River. Construction is completed except for the 165 m stretch of bank on which site 3LA97 is located.

The construction easement is a 400 ft wide strip paralleling the river bank. Within this corridor the 150 ft wide strip adjacent to the river is the direct impact zone (Fig. 3). The remaining easement has been left undisturbed. A dirt access road was cleared adjacent to the direct impact zone for the length of the item and was used to move equipment and rock from one end of the project to the other. As a first stage of construction the direct impact zone was cleared of all vegetation by bulldozers. Next, the bankline was reshaped from a natural vertical bank face to a long, standard slope, 150 ft wide. All excavated earth was piled into the river channel to be carried away by heavy rains. The lower portion of the slope was stabilized with large stone. The upper slope, above the normal flood line, was mulched and seeded. A V-shaped, shallow drain, approximately 2 ft deep and up to 5 ft wide at the top, was excavated along the top of the slope parallel to the river. The drain will decrease the hazard of erosion along the upper slope from heavy runoff.

In 1979, a cultural resources survey of the construction right-of-way was conducted by Coastal Environments Inc. under contract with the US Army Corps of Engineers, New Orleans District (Pearson et al. 1979). No sites were located. Construction at Field Revetment commenced during the spring of 1980. In April 1980, a dragline exposed Cedar Grove Cemetery (also known locally as Sentell Cemetery), buried 1.3 m below the present ground surface (for the local newspaper account see Figs. 4 and 5). On 24 April 1980 Ms. Sandra Blalock of the Arkansas Archeological Survey inspected the cemetery and noted that the historic graves intruded a prehistoric midden. Construction was halted immediately. The east-west site limits within the direct impact zone were delineated. Construction resumed up and downriver from the site. Under Contract No. DACW29-80-M-1870 with the New Orleans District, Arkansas Archeological Survey tested 3LA97 to determine its significance (Schambach et al. 1980). The site, including the historic cemetery, was determined eligible to the National Register of Historic Places. Under a separate contract (DACW29-81-C-0059) Arkansas Archeological



Figure 1. Field Revetment, March 1982. View to east-northeast from 3LA97 of completed upstream segment.



Figure 2. Field Revetment, March 1982. View to west-northwest across 3LA97 to completed downstream segment of revetment.

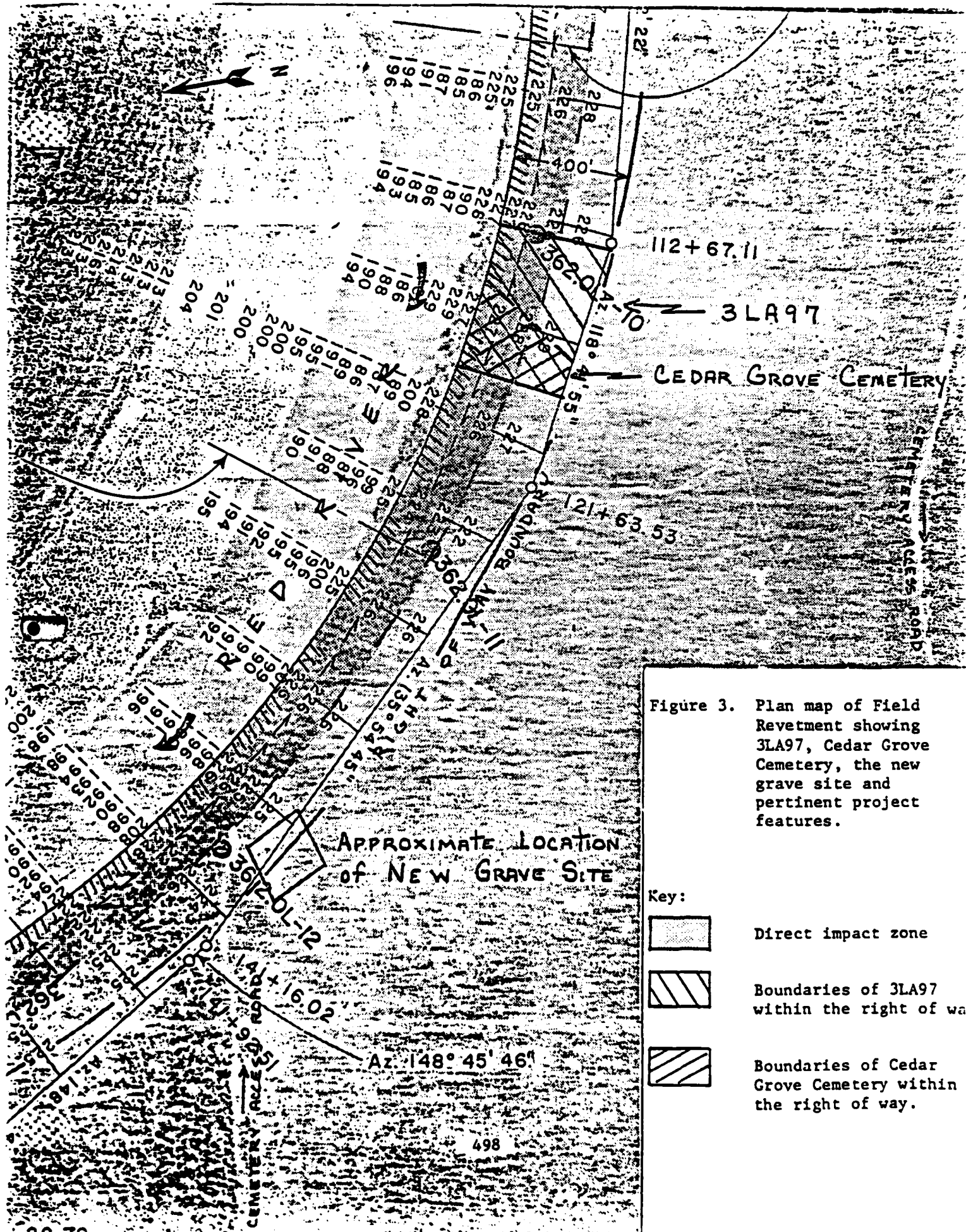


Figure 3. Plan map of Field Revetment showing 3LA97, Cedar Grove Cemetery, the new grave site and pertinent project features.

Lafayette County Democrat

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VOLUME 75

NUMBER 31

Lewisville, Arkansas 71845

THURSDAY, APRIL 17, 1980

Skeleton found on river bank

The skeleton found Monday morning on the east bank of Red River has been tentatively identified as that of a man who died in 1918. Jerry Thomas, director of the U. S. Corps of Engineers told the Democrat Tuesday afternoon.

The location of the ancient burial site was given as six

miles south of Highway 82 at Lester's Bend.

Sheriff Wade Tatom stated that shortly after noon Monday that Chief Doyle Mothershed from the U.S. Corps of Engineers reported what appeared to be the arm of a skeleton was seen sticking out of the bank of Red River where the Engineers were preparing to do revetment work, and asked for assistance in identifying the body.

Tatom and deputies went to the scene, located in an old community once known as the Little Egypt community, on Lester's Bend, and near the Jack Mulkey place.

The bank where the body was found was about 20 feet high above the level of Red River,

and the arm bone was sticking out about 10 feet above the height of the river, and 10 feet below the earth's surface.

A rope was tied to a tree on the bank and a workman was let down to the level of the arm

(See Skeleton, Page 7)

(Continued from Page 1)

★ SKELETON

and it was determined it was a complete skeleton. Further excavation revealed particles of white pine wood that may have been a casket, and pieces of iron that once held handles.

An unusual piece was a 6-inch glass saucer, perhaps of carnival glass, that was found over the breast bone of the skeleton. An iron inscription read "At Rest."

Tatom stated the State Medical Center was notified and requested the skeleton be sent there to determine whether it was male or female and also the length of burial. He said the body would be of a person about 5 feet 10 inches in height.

Help in identifying the skeleton was given by Peter Cullins of Route 2, Lewisville and by a marker found a mile away. The inscription on the marker was H. J. Jackson, Faithful Member Cedar Grove Circle No. 2, Died Sept. 1, 1918.

Those who have seen the marker stated there was triangle shaped design with the initials F C F in each corner.

Relatives of the deceased are being sought by the benevolent society, to find what disposition to make with the remains. It is not presently known if there are others buried nearby.

Thomas stated it was fortunate the skeleton was found before work was started at the site. He said the Corps and the contractor would co-operate with either the family of the deceased or the benevolent society in carefully excavating in the vicinity for other skeletons, and if necessary would leave this section until later.

If either the family or the benevolent society fails to assist in the matter, the Red River Levee District No. 1 has offered to re-inter the skeleton in another location out of the way of the revetment project.

Figure 4



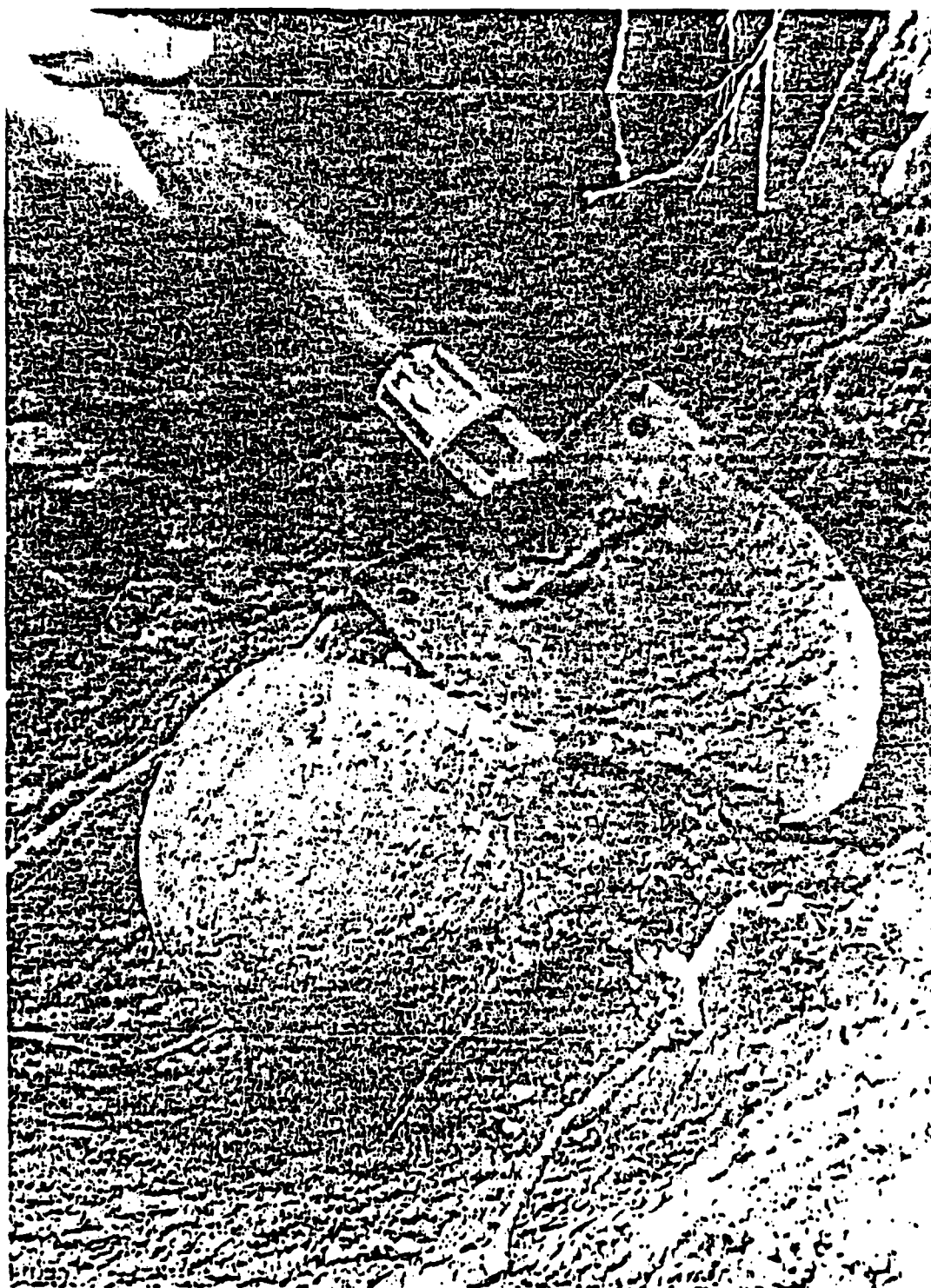
HUMAN BONES - Sheriff Wade 'Atom' holds bones of a skeleton uncovered Monday on the Red River near a point known as Lester's Bend south of Garland City.



DIGGING FOR SKELETON - Deputy Victor Knight, left, Investigator Don Hopper, center and Sheriff Wade Tatom uncover the bones of a body found Monday on the

bank of the Red River south of Highway 82. Standing at the top of the bank is Trooper Bill Fuller of the Arkansas State Police. (See related story on Page 1)

Staff Photo by Jim Lawrence



SKELETON FOUND - This human skull is a part of a skeleton uncovered Monday on the bank of Red River about six miles

south of the Garland City bridge. See related story and other photographs on other pages of this issue of the Democrat.

Staff Photo by Jim Lawrence

Skeleton unidentified

Arrangements are being made to have the skeleton found Monday of last week on a caving river bank in this county returned to Lewisville on Friday. Sheriff Wade Tatom reported Tuesday morning. He said the State Medical Center in Little Rock had completed its investigation and had concluded that it was that of a black man, 50 years of age, and height of 5 feet 10 inches.

In the meantime relatives of those who may have relatives buried in that area are making plans to have the bodies re-located in nearby cemeteries, it was also learned.

The body is tentatively identified as that of H.J. Jackson, that name appearing on a three-foot high marker found about a mile away from the skeleton, and thus far the only marker recovered.

W. Gammon Smith of 2410 Spruce Street, told The Democrat he remembers him as living next to his farm for four years before he died, stating that Jackson was a highly respected employee on the Lester Plantation. He said he remembers there was a cemetery near there called Sentell Cemetery, being named for a Mr. Sentell from Shreveport, La., who was the first owner of that land now referred to as Lester's Bend. There was a steamboat landing named Sentell Landing also nearby, and that a public road once went within 10 feet of the cemetery.

A Negro woman was the last person to be buried there, just before the 1927 flood, Smith remembered.

Smith said when the 1927 flood came it left the cemetery covered with a huge sand bed, and that the river was at one time almost a mile west of its present site and was surprised to learn the river had reached the cemetery.

Jerry Thomas of Shreveport, co-ordinator for the U.S. Corps of Engineers, told The Democrat last week that plenty of time would be given to relatives of those who may be buried to make arrangements for reintering their remains. He said the contractor for the relevelment would also co-operate, if requested, and would level off the cemetery to near the top surface of the burials.

Estimates of the number of burials have ranged up to 25, according to Gammon Smith. He thinks there were some small markers there at one time.

Lafayette County Democrat

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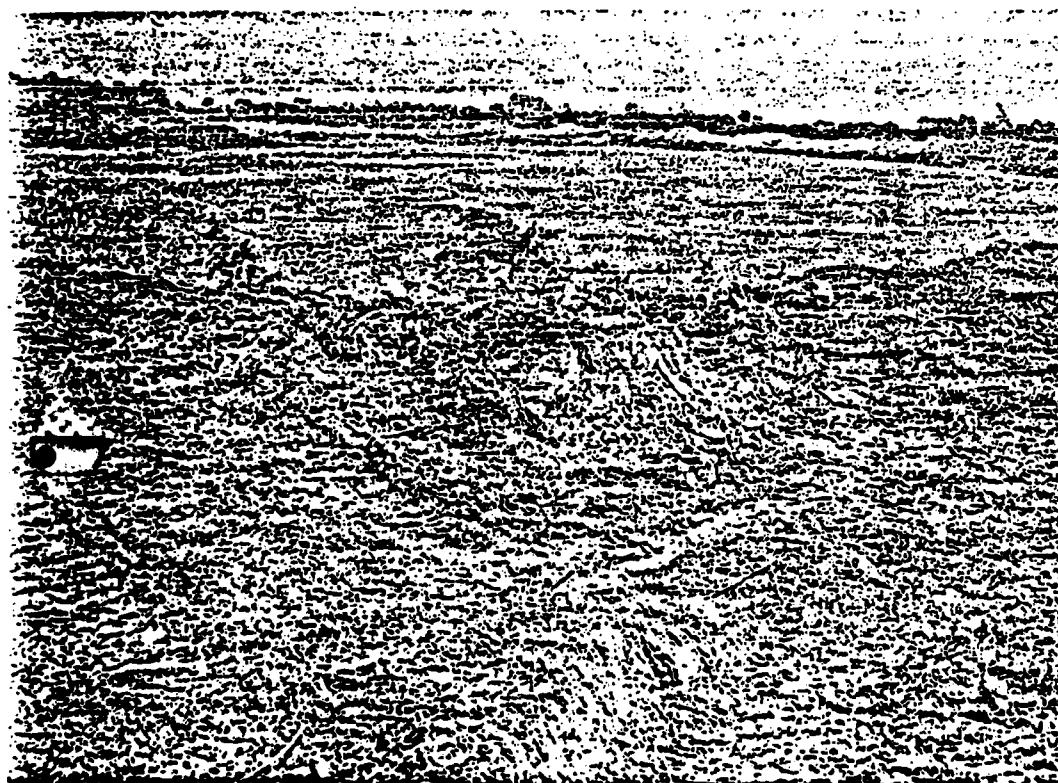
VOLUME 75

NUMBER 33

Lewisville, Arkansas 71845

THURSDAY, MAY 1, 1980

More markers uncovered on river bank



THE CENTURY-Old Sentell Cemetery at Lester's Bend on Red River (shown in foreground) was covered with five feet of sand during the 1927 flood, was recently discovered. The river is now eating into it.

Plans are being made to have the bodies buried there removed to a safer place. A dragline at right (background) is lining the spring banks with rock to prevent future erosion and flooding.

Three more markers have been discovered in the century-old Sentell Cemetery on the Lester Plantation on Red River, the first being found shortly after the cemetery was discovered April 14 on the bank of Red River by an inspector of the U.S. Corps of Engineers, leading the Red River Levee District No. 1 to obtain a court order to re-enter the bodies of these and perhaps others.

The Engineers were making survey within the vicinity, preparatory to doing excavation on the Field Revetment, six miles south of Highway 82.

A marker found a mile away from the cemetery is thought to have been that of H.J. Jackson who died September 1, 1918. A Certificate of Death obtained from the State Board of Health stated Horace Jackson, a Negro, died in the State Hospital after a year of illness. The name of parents were marked unknown. His age was given as 57.

Contractors on the revetment work at the site, in an attempt to discover other bodies that may have been buried there before it was covered with sand for a depth of five feet during the 1927 flood, last week uncovered the top of three markers to obtain their names, and ...

then replaced them.

These three were given as follows:

ANNIE WILKERSON, died 1915.

LUE POWELL, died Sept. 4, 1919, aged 64. Gone to a Better Land.

J.P. RICHARD, died 1910.

John Upton, an official of Red River Levee District No. 1, stated a court order would be obtained from the Lafayette County Circuit Court to remove the bodies from their present location and they would be re-interred elsewhere.

The Corps of Engineers stated the contractor on the revetment work would co-operate with relative of those buried there in the removal of the bodies.

The project is known as the Field Revetment, and will extend for about three-fourths of a mile downstream from the cemetery, Inspector Mothershed reported.

John B. Sentell, a native of Bossier Parish, who was the first owner of this area, was also the owner of Egypt Plantation in Bossier Parish, and named this plantation Little Egypt. A steamboat that plied Red River in those years was named "Sentell" after this prominent cotton planter. His will is filed in the County Clerk's office in Lewisville and was dated 1875. He is said to have given his laborers this plot as a burial ground, and it was named "Sentell" in his memory.

The area has been inaccessible for many years, the last burial being that of a woman shortly before the 1927 overflow. W. Gammon Smith of Lewisville stated last week.

Survey excavated a sample of the Caddo V and historic components, leaving the historic cemetery intact (Trubowitz 1982).

III. Affected National Register of Historic Places Property

The Cedar Grove site (3LA97) has multiple components, all of which extend south beyond the construction right-of-way for an unknown distance. These components include a prehistoric midden dating from the Caddo V period (ca. A.D. 1700-1800), a portion of a mid to late nineteenth century man-made levee, a road and Cedar Grove Cemetery (ca. 1840-1927). The cemetery is historically associated with the nearby Cedar Grove Baptist Church. The original church site may have been located at 3LA97, probably south of the direct impact zone. The cemetery is one of three contemporary burial grounds used by the church during the second half of the 19th century.

A Request for Determination of the No Adverse Effect for 3LA97 received Advisory Council concurrence in 1980. Data recovery, following an approved mitigation plan, was completed on the Caddo component, historic levee and road. Six marked historic graves were removed under court order by Red River Levee District #1 and Cedar Grove Baptist Church for reinterment in locations chosen by relatives and the church. In 1980, the nature and size of the cemetery were unknown. Any additional graves were to be relocated by the Levee District. Accordingly, Arkansas Archeological Survey was instructed to tag and map but not disturb all newly located graves during their excavation.

A total of 103 unmarked historic grave shafts were identified from surface stains (Fig. 6 from Trubowitz 1982: 85b, Fig 7-7). Clarification of the eligibility of the cemetery was requested and received from the National Register of Historic Places by letter, dated 28 May 1981 (Fig. 7). The cemetery has been found eligible on its own merit under criteria a and d, for its potential to yield demographic, pathological and socio-economic data pertaining to a rural Black community in transition from a slave economy to one based on tenant farming.

IV. Physical Appearance of Cemetery and History of Disturbance

The site is located in the flood plain of the Red River on a relict natural levee. In this vicinity, the river follows a large meander that has enlarged and is migrating down valley into the site. Around 1915 the area was covered by a shallow clay lens, then buried under 1.2 m of sand and silt during the dramatic flood of 1927. Today, residents recall that there once was a cemetery on Lester Bend but no one relocated it after the flood. For the last several decades, the locale has been cultivated annually. The 1927 flood deposits were deep enough to prevent disturbance from modern agricultural techniques, such as land leveling and chisel plowing.

The most recent disturbances have been gradual bank erosion and exposure in 1980 by construction equipment and excavation of other 3LA97 components. It is difficult to determine how much of the cemetery has been destroyed by the migration of the river. Figure 8 (Trubowitz 1982: Figure 6-3) illustrates the inland location of the cemetery in 1925 on Lester Bend. Today, graves are adjacent to the bank. Trubowitz (1982: 87) hypothesizes that the present northern edge of the site corresponds with the original northern limits of the

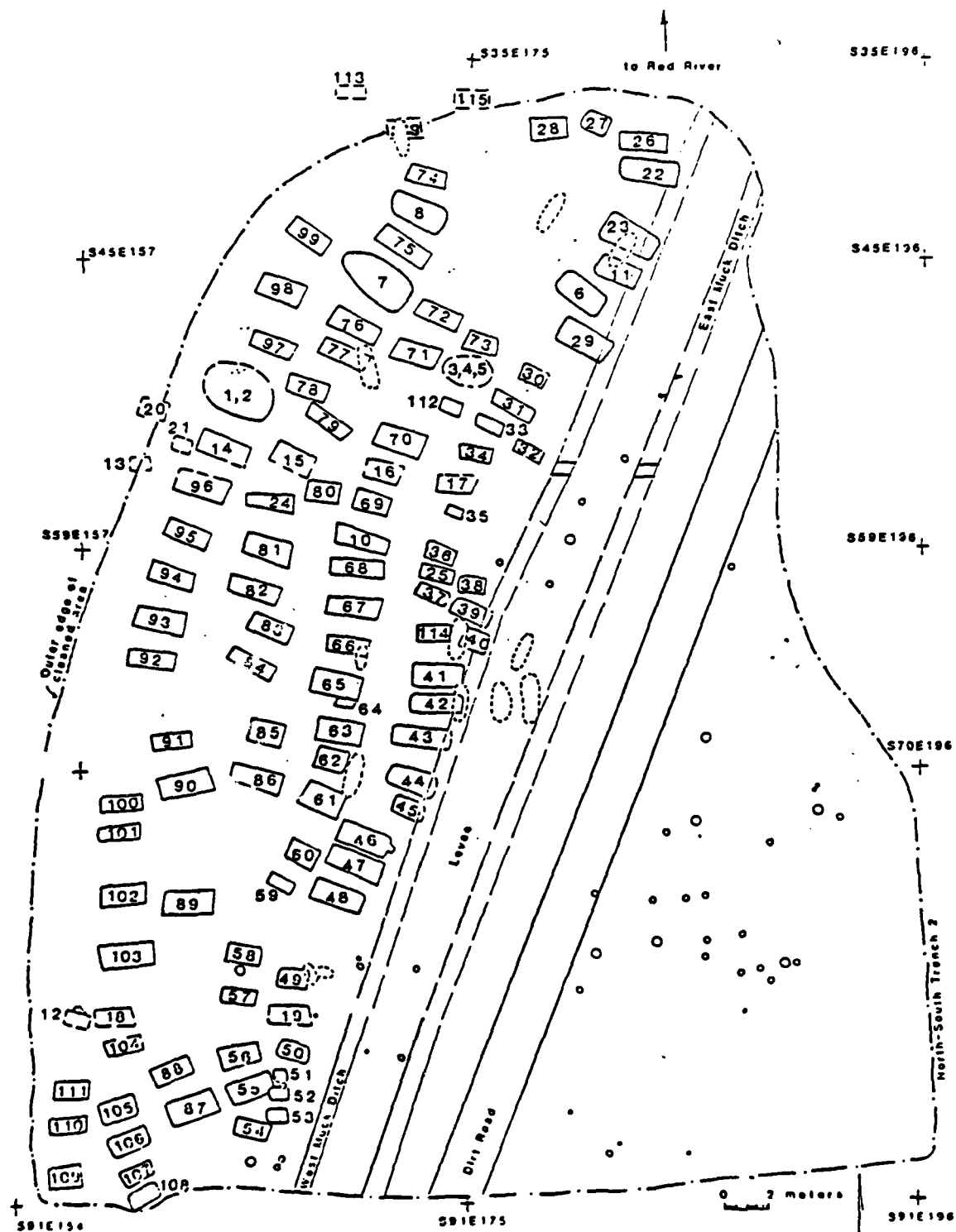


Figure 6. Historic burials in the direct impact zone (Trubowitz 1982:85b, Fig 7-7).

Key:
 [] Historic graves removed during summer, 1980
 [] Historic graves still to be removed



United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20243

P-11
ACJ-2

IN REPLY REFER TO: 436

MAY 28 1981

Colonel Thomas A. Sands
District Engineer
Department of the Army
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160

Dear Colonel Sands:

Thank you for your letter of March 19, 1981, regarding the eligibility of the Cedar Grove Cemetery, a component of site 3LA97. We want to clarify a possible misunderstanding. As noted by both the Advisory Council on Historic Preservation and the Arkansas State Archeologist, our determination of eligibility for site 3LA97 did include the historic cemetery as a significant component of the site.

Your letter has served to initiate a thorough reconsideration here of the Cedar Grove Cemetery's eligibility under our criteria as well as a review of our general policy with regard to cemeteries, both prehistoric and historic. As your letter correctly notes, cemeteries are not ordinarily considered eligible for listing in the National Register. The intent of this exception was to limit consideration of cemeteries, a ubiquitous property type that commonly carries considerable sentimental associations, but which individually may not have been subject to objective scholarly analysis to determine historic significance. However, cemeteries may embody values beyond personal or family-specific emotions; therefore, the National Register criteria allow the listing of cemeteries as exceptions when a cemetery is significant because of age, distinctive design features, graves of persons of transcendent importance, or association with historic events. The last has been interpreted broadly in a manner similar to criterion A: "...associated with events that have made a significant contribution to the broad patterns of our history". We have listed cemeteries in the past which exhibited significant characteristics in all of these areas, but will concentrate in this discussion on the "historic events" consideration. Cemeteries listed or determined eligible under this provision have been primarily one of two types: 1) those related to specific events, such as Civil War graveyards; and 2) those related to general events, illustrative of broad patterns, such as prehistoric burials which may yield "information important in the understanding" of broad patterns of our history (e.g. mortuary practices and physical effects of changing subsistence patterns). The information recoverable from these remains is generally unavailable elsewhere.

Colonel Thomas A. Sands

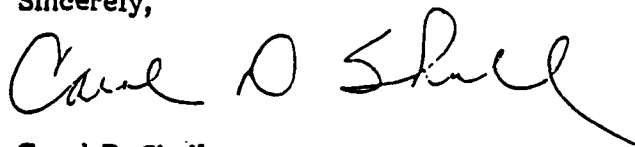
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Similarly, our review of the documentation currently available has led us to the conclusion that most of the information which could be obtained by study of the remains at the Cedar Grove Cemetery is not available elsewhere. Both your letter and a telephone consultation with Beverly Watkins, who is preparing the historical research on the cemetery, indicate that there is a dearth of written material on the rural Black population represented by the cemetery. Scientific study of these remains would result in valuable demographic and pathological information. This kind of data, especially when viewed in the context of information for different areas and/or varying socio-economic or racial groups, will increase our understanding both of the cultural patterns and living conditions of this rural Black community and how these may be illustrative of a broader post-Civil War phenomenon of the transition of a slave economy to one based on tenant farming with accompanying social, economic and demographic effects.

Thus we are confirming our earlier determination that Cedar Grove Cemetery is an eligible historic resource, not only as a component of the site 3LA97, but on its own merit. We do not regard this decision as a blanket reading on the eligibility of cemeteries in general, but rather a determination that the particular circumstances of this cemetery and the people whom it represents qualify the property for the National Register under criteria A and D as specified in our regulations.

We appreciate this opportunity to clarify our position on this matter. If you have any further questions, please call or write. Thank you for your interest and continuing concern in historic preservation.

Sincerely,



Carol D. Shull
Chief of Registration

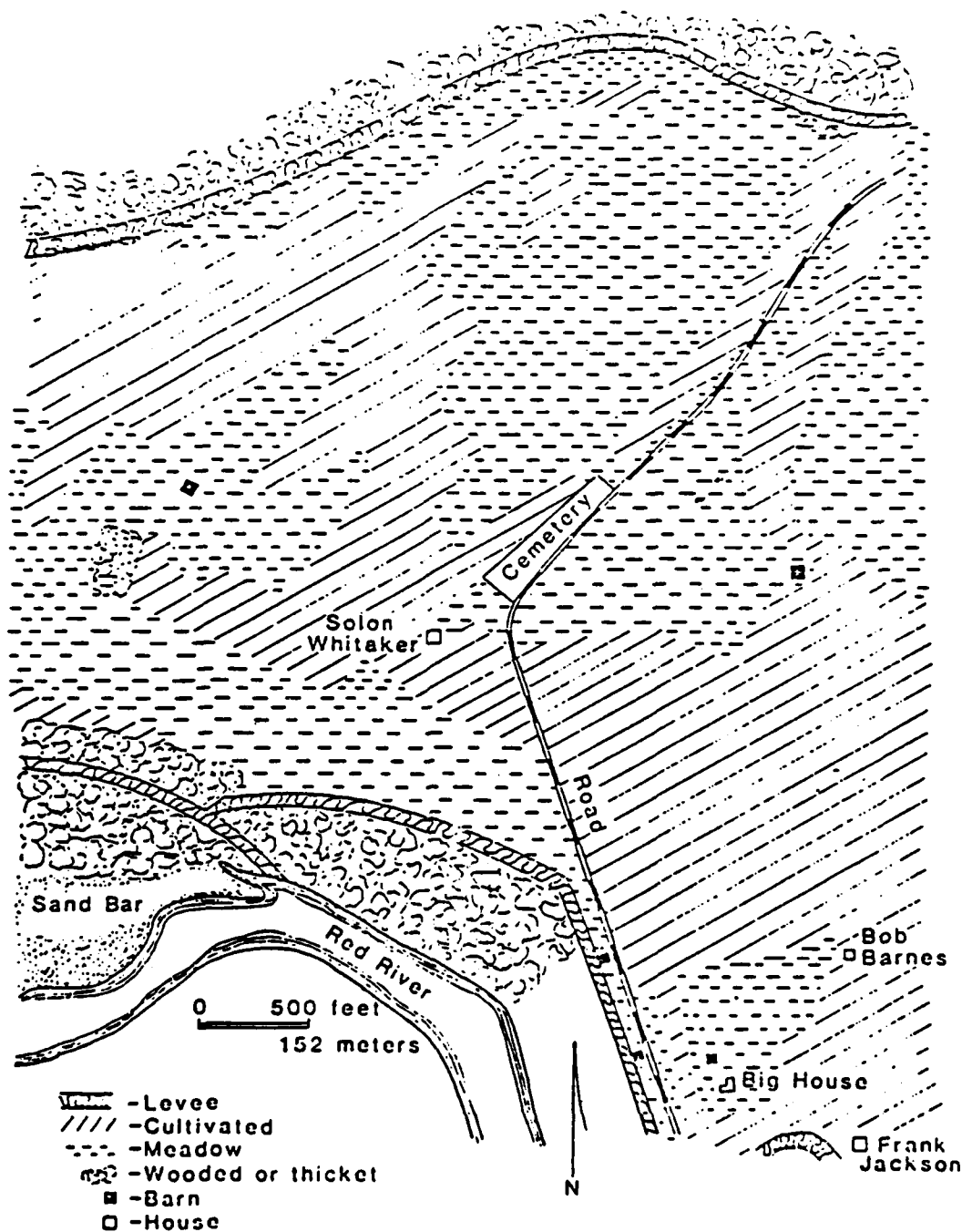


Figure 8. Lester Brothers property surrounding the Cedar Grove Cemetery in 1925 (after Christian 1925) (Trubowitz 1982:795, Fig 6-5).



Figure 9. Existing condition of Cedar Grove Cemetery in direct zone,
March 1982.



Figure 10. 3LA97 bankline, March 1982.

cemetery and that the major portion of this component is intact. If the 1925 map is accurate, the cemetery covered 2,787 m² (182 x 15m) and may have contained as many as 279 burials. Trubowitz (1982: 88) calculates that approximately 153 graves are located south of the direct impact zone.

During excavation of the Caddo component the contents of 3 historic graves were partially exposed, then covered. Although unplanned, this disturbance provided valuable information for assessing the state of preservation of these historic burials. Coffins have disintegrated but their outline was visible along the top edge of the side panels. Coffin hardware, screws and nails were also present. Bone appeared to be solid and well preserved. Burial 13, that of a child, was located approximately 2 ft below excavation surface. Based upon backhoe trench data the tops of other burials are expected to be located approximately 3 ft below the present ground surface. There was no archeological evidence that any of the remaining graves were ever marked by head or foot stones.

The present ground surface is weathered, covered by a light growth of weeds and has been trampled by the landowner's cattle (Fig. 9). All 1980 tags identifying the location of individual burials have disappeared.

V. Application of the Criteria of Adverse Effect

A. Destruction or Alteration

Cedar Grove Cemetery has already been altered by revetment construction. Six graves have been removed as a direct result of rediscovery. Excavation of other site components exposed 105 grave shafts when alluvial overburden was mechanically removed. Three individuals (Graves 11, 13 and 23) were partially exposed during excavation but remain in situ. An unknown number of graves have eroded into the river due to the southward migration of the channel and associated erosion of the bank.

Figure 10 illustrates the natural bank gradient as it existed in March 1982. Graves are located within 10 ft of the bankline. Any bank stabilization design will require alteration of the bankline gradient and relocation of numerous graves. Redesigning the revetment to take less than 150 feet of easement is not practical. Redesign would create problems at the joint of the new alignment with the arc of the existing revetment on either side of the site. Some graves would have to be moved. Those left within the direct impact zone would be subject to probable damage by the repeated passage of heavy equipment over them.

The choice of leaving the revetment incomplete to avoid further construction impact on 3LA97 is also impractical. Both the revetment and the site would eventually be damaged by erosion and landside run-off following high water periods.

Completing Field Revetment as designed will require removal of 105 burials to a more protected location. Once completed, however, the revetment will protect the remainder of 3LA97 from further encroachment by the Red River. Appendix A presents an outline of a mitigation plan for relocating the 105 burials.

B. Alteration of Environment.

Since its settlement in the 19th century, the project area has been rural. Cedar Grove Cemetery was originally located on the riverside of a low levee and dirt road on what was probably not considered prime farm land in the mid-1800's (Trubowitz 1982: 79). Only since the 1927 flood has the site locale been cultivated. The construction project will not alter 20th century land usage. It is designed to halt the very active and destructive meandering of Red River across valuable agricultural land.

A portion of Cedar Grove Cemetery will be relocated approximately 580m downstream from the present site. Mr William Triplett, the landowner, has designated a general area from which he is willing to donate a plot large enough to accomodate the affected Cedar Grove burials. The topography of the new grave setting will be very similar to that of the original site. The proposed plot is low, cleared but not cultivated, and unimproved. It is located along a gravel road which will provide access for members of Cedar Grove Baptist Church for care and maintenance. The river bank, approximately 300 ft north of the site, is already reveted. The majority of the proposed plot falls within the right-of-way surveyed by Coastal Environments Inc. in 1979 (Pearson et al. 1979). No sites were found in this vicinity. Although the cemetery will be divided the integrity of the setting of both parts is protected by their topographic similarity and their close proximity to one another on Sentell Plantation land. It is of interest to note that Cedar Grove Baptist Church has divided the burials of its members among three known cemeteries for at least a century. The further division of Cedar Grove Cemetery reflects the tradition of burying human remains where space is available.

C. Additional Effects

The revetment will not introduce any visual, audible or atmospheric effects which are out of character with the riverine setting. As described in Section II of this document, revetment construction is a bank stabilization method by which the bankline is altered to a standard slope, then stabilized with large rock. The top of the bank is seeded. The project includes no structures which alter the site setting. Relocation of a portion of the cemetery does alter the total context of the site by separating it into two parcels. The proximity of the new grave plot to 3LA97, however, and the care taken during relocation to protect individual graves and the data they contain is preferable to allowing the cemetery to erode into the river.

D. Deterioration of Property.

The proposed project was designed to halt property deterioration caused by natural forces. The project will contribute to the preservation of the remaining portion of 3LA97 and any additional but undiscovered buried sites in the vicinity. Relocating a portion of the cemetery is proposed as a direct action to protect the data value of individual graves and terminate the ongoing, gradual deterioration of the total site.

E. Transfer or Sale.

Construction of the revetment project involved no transfer or sale of property which affects maintenance or preservation of 3LA97. Property ownership is retained by the present landowner. A construction easement was obtained by the Red River Levee District #1 for a 400 ft corridor adjacent to the river bank. The Corps of Engineers procured the contractor, supervised construction and will maintain the revetment at the request of the Levee District.

Cemetery relocation does require a transfer of title, however. By legal agreement, the Red River Levee District #1 was responsible for providing a free and clear easement to the Corps of Engineers prior to construction. Under this agreement the Levee District is still responsible for removal of the cemetery. Relocation was complicated in 1981 by the lack of adequate space for 105 bodies in any existing local cemetery; the lack of Levee District or Church funds to purchase a new cemetery plot; legal aspects of the easement agreement which bar the Corps of Engineers from instituting Department of the Army regulation procedures for cemetery relocation; and, finally, a lack of consensus between the agency, State Historic Preservation Officer and other concerned parties regarding the definition of adequate mitigation of adverse impacts.

Under the proposed plan the landowner has agreed to donate a plot. Mr. Triplett's generosity alleviates the problem of inadequate funds for property purchase. The parcel will be deeded to Cedar Grove Baptist Church for perpetual care, an act which partially satisfies Arkansas state law regarding reinterment and care of burials placed in other than professionally managed cemeteries. The Corps of Engineers will fund the relocation as a mitigation feature. The final mitigation plan is subject to approval by the Lafayette County Circuit Court which must issue a court order before the project can proceed.

Maintenance and preservation of the resulting new grave site will be the responsibility of Cedar Grove Baptist Church. The amount of land requested from the landowner is of sufficient size to bury the bodies in question. The grave is designed to be a mass grave for these individuals only and not a plot for the general use of the church. This restriction should discourage future interments in the plot and disturbance of the Cedar Grove boxes or the internal order of the grave.

V. Cost of Undertaking

Funds for the Red River Emergency Bank Protection Project were authorized under the WRD Act of 1976, dated 22 October 1976 (Public Law 94-587; House Document No. 1755, 91st Congress, Second Session). The act provides that local interests contribute 25 percent of the construction costs of retaining dikes, bulkheads and embankments and that the Federal Government contribute 75 percent of these costs. The federal share of the Emergency Bank Protection Project is \$51,500,000. The non-federal share is \$2,250,000. Of this total, the estimated cost for Field Revetment construction is \$1,117,000.

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PROPOSED MITIGATION PLAN
CEDAR GROVE CEMETERY, 3LA97

The following mitigation plan is a modification of Department of the Army cemetery relocation procedures. The goals are to relocate all graves in the direct impact zone to a new burial site, collect observable data from each grave, and preserve in situ the remainder of the cemetery south of the direct impact zone. The cooperative effort of physical anthropologists, archeologists and representatives of the Lafayette County coroner's office and the Red River Levee District #1 will be required.

The work will be conducted by professional archeologists under contract to the New Orleans District. Physical anthropologists will be required to obtain the proposed measurements, outlined below, and limited pathological data. The Levee District crew will provide mechanical equipment assistance, transport coffins and prepare the new grave. The proposed plan complies with the current wishes of Cedar Grove Baptist Church (Fig. 1, letter dated 16 April 1982). The Church has stated that reburial within 24 hours of exposure is preferred by the congregation. Specific points of the plan follow:

1. Red River Levee District #1 has agreed to obtain 0.5 acres of uncultivable land from Mr. William Triplett, the owner of Cedar Grove Cemetery, for use as a new cemetery plot. The plot will be deeded to Cedar Grove Baptist Church for perpetual care. The suggested plot, its location and condition are discussed in Section V B of the Request for Determination of No Adverse Effect. The vicinity was surveyed by Coastal Environments Inc. (Pearson et al. 1979). However, should the specific final plot be selected from land outside the Field Revetment right-of-way a cultural resources inventory survey will be conducted prior to the initiation of grave relocation.
2. Red River Levee District #1 will obtain the necessary court order from the Lafayette County Circuit Court for cemetery removal and reburial. Arkansas law does not recognize historic cemeteries as cultural resources and is fairly strict regarding the limitation of authorization to disinter and study human remains. Because the proposed plan represents the interests of Cedar Grove Baptist Church, obtaining a court order is not expected to present additional problems.
3. Using a small bulldozer, the top few weathered inches of the site will be removed to expose the grave shaft stains identified in the direct impact zone in 1980. All overburden will be removed from the western edge of the site within the direct impact zone to make sure that all graves have been located.
4. Grave shafts will be augered to determine the depth of the coffin remains from the present ground surface. If several feet of grave shaft fill are present over a broad area, the bulldozer may be used to remove the soil down to approximately one foot above the remains. It can be expected that graves were dug to varying depths. This step will be handled with the greatest of care.

5. The remaining grave fill will be excavated to the top of the coffin remains using trowels and hand tools.

6. The remains of each grave will be cleaned, photographed and recorded. Systematic observations will be recorded to define the state of preservation, position of the body, mortuary practises, presence (and identification) or absence of grave goods, and presence or absence of obvious pathologies. Appropriate measurements will be taken to establish the age, sex, height and race of each individual. A photographic series of the contents of each grave will be made for future study and identification purposes.

7. The remains will be removed (including remains of the coffin, hardware, skeleton and all grave goods) to a new box which will be transported to the new grave site within 24 hours of grave opening. Part of the grave fill will be transferred to the new box to cushion the skeletal remains during transport and reburial. Each new box will be assigned a catalog number which will appear on a metal tag inside the box and on a metal plate attached to the exterior of the box. Grave removal is expected to require two to three weeks to complete. Graves will be removed and reburied in groups.

8. All individuals will be systematically reinterred in a mass grave. The new boxes will be arranged in numerical order within the grave based upon the catalog number. The provenience of each box within the grave will be mapped for future reference. At ground surface, the mass grave will be marked by four corner stones and a single headstone which describes the grave's contents and origin.

9. The field data will be analyzed within the context of site significance and other similar studies (Angel 1976; Shapiro 1930; Thomas et al. 1977; Joan Koch, Kathy Deagan and John Erenhard, personal communications). The field data will be augmented with additional archival research and an illustrated report of findings will be prepared.

Some valuable data are expected to be retrieved. However, it is important to recognize at this time the limitations of the sample. It is not known what portion of the cemetery is being impacted. The nonrandom character of the sample in question prejudices any extension of the data if used to represent Cedar Grove Cemetery as a whole. Further, Cedar Grove was one of the three cemeteries developed by Cedar Grove Baptist Church during the 19th century. Since all three were used contemporaneously the Cedar Grove sample cannot be used alone to reconstruct the socio-economic and pathological history of the Reconstruction Period in Lafayette County as the National Register intended. Only when studied as a group would the the three cemeteries yield the kinship, actuarial and bioarcheological data necessary to reconstruct a reliable demographic model for the period. Such a study is clearly beyond the scope of any undertaking associated with Field Revetment construction.

The Cedar Grove sample is expected to yield the following classes of data which can be analyzed and applied to general research issues.

a. Population statistics will be derived from the age, sex, race, height, and general pathological data collected in the field. When combined with archival and courthouse record data, these statistics will provide skewed but valuable demographic data assignable to a specific community over a known 80 year period.

b. The observed burial practises of this specific socio-economic group can be contrasted to archival records of cemetery societies such as the Royal Circle of Friends. The contextual data to be collected will yield information about coffins (types, sizes, shapes, hardware, construction techniques) and burial practises (body position, relationship of clothing and grave goods to the body, choice of grave goods, evidence of burial related superstition or fetish).

c. The ordering and grouping of burials and the choice of grave goods (potential indicators of both social status and relative age of interment) will yield data applicable to differentiating social versus temporal stratification as a factor in determining grave placement. Other factors, such as topography, should also be investigated.

d. Relative age of burials may be determined by diagnostic grave goods, if any are present, or by documented changes in burial practises over time.

In summation, the proposed mitigation plan will retrieve basic skeletal population statistics and provide for appropriate protection of the skeletal sample both as a cemetery and as a National Register eligible site. The plan calls for full recovery of contextual data which will be lost as soon as each grave is exposed and removed. These contextual data are relevant to the study of burial practises and are essential to proper interpretation of any analysis made of Cedar Grove Cemetery data at this time or in the future. A full report of the data collected, the analyses run and the methodologies used will be prepared for use by the anthropological community. The report will include a catalog and full photographic record of the remains as well as provenience maps of the original and new grave sites. The central goals of this project are retrieval and reporting of data which are ordinarily lost during cemetery relocation, careful and systematic disinterment and reinterment, and protection of the integrity of the skeletal remains for future study.

SCOPE OF SERVICES FOR
CHANGE ORDER P00002
CONTRACT NO. DACW29-81-C-0059
DATA RECOVERY AT CEDAR GROVE CEMETERY

1. General Nature of the Work to be Performed.

The overall goals of this project are to locate all historic graves in the Field Revetment direct impact zone, carefully excavate the remains, collect observable data from each grave, rebox and rebury all remains at a new grave site and preserve in situ the remainder of the cemetery south of the direct impact zone. The contractor will provide the equipment, archeological and osteological expertise necessary to locate the graves, excavate them, record them, transport them to the new grave site, describe the data and produce a report of findings.

2. Study Requirements. The contractor will recover, analyze and report archeological, historical and bioarcheological data from Cedar Grove Cemetery in a manner which is consistent with Appendix A: Proposed Mitigation Plan and the judgement of the Circuit Court of Lafayette County, Arkansas.

a. The contractor will locate all historic graves within the direct construction impact zone of Field Revetment (Figure 1). Arkansas Archeological Survey previously identified 105 grave shaft stains in this area. This number is no longer absolute. Recent erosion at the north edge of the site destroyed multiple burials. Conversely, a spoil pile along the western edge of the site may cover additional graves not previously recorded. The contractor will remove the spoil pile from the western edge of the site and locate all graves beneath it.

b. The Contractor will carefully determine the depth below surface of skeletal and coffin remains. In order to control the removal of overburden from the top of graves, heavy equipment should not be used to directly expose coffin remains. It is recommended that grave fill of approximately one foot in depth be left in situ above each coffin for the protection of the contextual data.

c. The Contractor will assign a permanent catalog number to each historic grave shaft and its contents. The Arkansas Archeological Survey's numbering system from the 1980 field season should be maintained for continuity of record. If a more versatile numbering system is required, a master key shall be produced which correlates the two systems with one another. Once each skeleton, its associated coffin remains and grave goods are removed from a grave, they will be treated as a grave lot. Each grave lot will be handled as a discrete unit. At no time will items from several grave lots be mixed together.

d. The Contractor will carefully expose the top of each grave with hand tools. Each stage of excavation should be photographically recorded.

e. All photographs taken under the auspices of this project will include a metric scale and, when appropriate, a directional arrow.

f. During excavation, the Contractor will record the following information for each grave: alignment of the body, state of preservation, presence or absence of grave goods, gross identification of grave goods and their juxtaposition to the body; details of coffin size, shape, workmanship, hardware, etc. and any evidence of behavior pertinent to the description of mortuary practises.

g. The contents of each grave lot will be removed and transferred to a field laboratory where the skeletal and artifactual remains will be cleaned, photographed (with metric scale) measured and the data recorded on standardized forms. Molds of the dentition will be taken for future reference. Osteological measurements will be taken to determine at a minimum the age, sex, race, and stature of each specimen.

h. The coffin fill and surrounding grave shaft fill will be collected in a controlled manner and water or dry screened to retrieve small associated artifacts.

i. The Contractor will be responsible for protecting the remains from the elements and from vandalism for the duration of time that each grave lot is out of the ground.

j. The Contractor will transfer the total remains of each burial to a new coffin, to be supplied by Red River Levee District #1. The Contractor will assure that all grave goods belonging with each grave lot accompany the body into the coffin. A rust proof metal label marked with the appropriate catalog number will be placed inside the new coffin. A rust proof metal plate marked with the same catalog number will be attached to the lid of the new coffin or box. The Contractor will transport the sealed boxes to the new grave site and place them in the grave in numerical order.

k. This change order provides for 40 hours of operator and heavy equipment time. The heavy equipment will be deployed to clear the site of overburden, expose the western perimeter of the impact zone, and excavate a single new grave in the location designated by the landowner. The grave will be neatly rectangular and of uniform depth so that all coffins have approximately the same elevation. The grave will be deep enough to assure that all coffins are covered by 6 feet of fill.

l. The Contractor will provide a legal description of the new grave site and its boundaries. He will also record the provenience of each coffin and prepare a scaled drawing of the interior of the new grave site which shows the location and number of each coffin. The interior of the new grave will be photographed to document its internal arrangement. Using mechanical equipment, the Contractor will cover the new grave with earth.

m. The Contractor will describe and summarize the osteological, contextual and artifactual data collected from each grave lot in a photographically illustrated report of investigations. The report will include a background section which presents previously obtained information about Cedar Grove Cemetery, its sister cemeteries, Cedar Grove Baptist Church, their historical significance in southwest Arkansas and their similarity to other sites in the southeastern US. The body of the report will describe not only the field and laboratory methodologies used to collect the data, but the

extent of the data themselves. The data may be grouped into broad categories for the purposes of this report. Topics which should be addressed include observations on individual skeletons, the cemetery population as a whole, grave goods, coffin remains, and evidence of mortuary practices. Descriptive population statistics will be given for age at death, sex, race, stature and observed gross pathologies. If data on other population parameters are available they will be given as well. The description of the data will be followed by a summary discussion of all collected data in terms of the significance criteria for which Cedar Grove Cemetery was found eligible to the National Register of Historic Places. All raw data (all measurements, observations and identifications made on each grave lot), a catalog of all photographs and a map of the interior of the new grave site will appear as appendices to the end of the report. An outline of the report is given below in paragraph 3a.

n. The Contractor will confer by telephone once a week with Contracting Officer's Representative during the field phase. During the laboratory and analysis phase the Contractor will prepare a written preport of progress due on the 5th of every month. The report will identify problems as they arise, outline the work completed and the results, and include an estimate of the cumulative percentage of total work completed to date.

3. Reports.

a. Report content will include but not be limited to the following sections:

- 1) Introduction - reason for work and scope of study
- 2) background data on cemetery
- 3) methodology used during field and analysis phases
- 4) description of all categories of recorded data
- 5) interpretation of the data
- 6) integration of the data with information already collected on Cedar Grove Cemetery and the region
- 7) conclusions
- 8) statement of hypotheses which further study of the Cedar Grove skeletal population might answer
- 10) references cited
- 11) appendices for raw data, a catalog of all photographs taken, and interior plan of new grave.

b. The written report shall follow the format requirements set forth in the attached MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) the format/layout of the cover will be provided by the Contracting Officer's Representative; (3) page size shall be 8 1/2 x 11 inches with a 1 1/2 inch binding margin and 1-inch margins; (4) the reference format of American Antiquity will be used. Spelling shall be in accordance with the US Government Printing Office Style Manual dated January 1973.

4. Schedule of Work. The Contractor shall proceed with the removal within 5 days of receipt of the notice to proceed. The Contractor shall prepare and submit 5 copies of a draft report of investigations within 85 days of receipt of notice to proceed. The Government shall return review comments to the Contractor within 60 days. The Contractor will then have 60 days to incorporate or resolve all comments, prepare and submit one reproducible,

photo ready, master copy and 35 bound copies of the final report and all appendices.

5. Principal Investigator. The principal investigator (PI) shall be an individual responsible for the validity of the material presented in cultural, historical, and archeological reports who shall have recognized expertise in these fields, shall sign the final report, and in the event of controversy or court challenge, shall testify on behalf of the Government in support of report findings. The PI shall serve as the principal point of contact and liaison with the Contracting Officer, or his representative, for all work if required under the contract, and shall spend the time required in direct supervision and direction of the entire project to provide a professionally sound technical report. He shall be responsible for the written report and shall be held accountable for statements of significance and conclusions.

6. Right of Entry. The Government will provide right of entry to Cedar Grove Cemetery and the new grave site. Access to both sites is available by a single entry to the property. The Contractor will restrict his activity on the property to 3LA97 and the new grave site. Further responsibilities of the contractor are given in paragraph 10, below.

7. Government Obligations. The US Army Corps of Engineers, New Orleans District, shall provide the Contractor with project maps and quadrangle maps as needed and make available any other pertinent data in its holdings to facilitate the orderly conduct of the investigation. Such devices are furnished on a loan basis only and shall be returned to the district office upon completion of project unless otherwise anticipated.

8. Publicity. Any requests for information should be forwarded immediately to the Contracting Officer's Representative. During the period of service, all data or conclusions to be released for publication or presentation at professional meetings shall require the prompt concurrence of the Arkansas Archeological Survey and the Contracting Officer or his authorized representative. The provisions of this article shall extend also to the release of any such material to any person not so authorized by the Contracting Officer.

9. Inspection. A representative of the Government will be present on site for the duration of the cemetery removal and reinterment. Any authorized representative may at all reasonable times inspect or otherwise evaluate the work being performed hereunder and the premises in which it is being performed. If any inspection or evaluation is made by the Government on the premises of the Contractor or subcontractor, the Contractor shall provide and shall require his subcontractors to provide all reasonable facilities and assistance for the performance of their duties. All inspections and evaluations shall be performed in such a manner as will not unduly delay the work.

10. Responsibility of the Contractor. Arkansas Archeological Survey safety procedures will be followed during the contract period. The procedures will meet or exceed requirements detailed in the US Army Corps of Engineers General Safety Manual (EM 385-1-1). The Contractor shall be responsible for all damages to persons and property which occur in connection with the work and service under this contract, without recourse against the Government. The

Contractor shall provide maximum protections, take every reasonable means, and exercise care to prevent unnecessary damage to existing historic structures, contemporary structures, landscape plantings, natural features, roads, utilities, and other public or private facilities. Special attention shall be given the historic structures, natural and landscape features of the area, and special care shall be taken to protect these elements in their surroundings. The Contractor shall not cut, injure, or destroy vegetation, or damage property without express authority from the owner.

11. Investigations of Field Conditions. Representatives of the Contractor are urged to visit the areas of the proposed actions and by their own investigations satisfy themselves as to the existing conditions affecting the work to be done. If the Contractor (including his subcontractors) chooses not to visit the entire area, he will nevertheless be held responsible for having knowledge of conditions which a reasonable inspection would have disclosed. The Contractor shall assume all responsibility for deductions and conclusions as to the difficulties in performing the work under this contract which such an inspection could reasonably be expected to reveal.

12. Contractor's Organization. The Contractor shall furnish to the Contracting Officer within 2 days after receipt of the work requirement a chart showing the overall organization provided for the performance of this work and the names and titles of personnel employed in connection with the work, and shall furnish from time to time, revised organization changes reflecting any substantia changes therein. The Contractor shall maintain professional standards of employee competency, conduct and integrity.

13. Changes in Scope of Work. The Contracting Officer may upon issuance of a written order to the Contractor make any change in the general scope of this contract. If these changes necessitate an increase or decrease in the cost or time originally agreed upon, adjustment will be negotiated and the contract shall be modified accordingly.

a. Delays. In the event these schedules are exceeded due to causes beyond the control and without the fault or negligence of the Contractor, the contract will not be modified in writing, and the contract completion date will be extended one calendar day for each calendar day of delay.

APPENDIX V

A DATA-BASE MANAGEMENT SYSTEM FOR BIOARCHEOLOGICAL APPLICATIONS: AUTOMATED MANAGEMENT AND ANALYSIS OF THE CEDAR GROVE MORTUARY POPULATION

by James A. Farley

ABSTRACT

A data-base management system is developed to meet both the immediate analytical and management needs presented by the Cedar Grove data set and the general needs of the bioarcheological community. Using a microcomputer to conduct data input and preliminary analysis, while preserving the potential to utilize the analytical strength of mainframe statistical packages this system is designed to promote the type of integrated data-base required for effective bioarcheological analysis.

INTRODUCTION

The issues associated with large, complex data sets and their relationship to anthropological research have been widely addressed in recent years (Gaines 1981; Whallon and Brown 1982; Carr 1984). These discussions have examined: (1) the philosophical basis for investigating complex data structures (Carr 1981; 1984), (2) alternative methods for establishing or defining the analytical structure of a data set, through the association of attributes or objects (Hodson 1982; Spaulding 1982), (3) potential strategies for preserving previously defined relationships between data items in a framework which emphasizes organization as a prerequisite to analysis (Chenhall 1975; Scholtz and Millon 1981; Limp and Cook 1981), and (4) the step-wise or multi-level characteristics of the analytical process in scientific investigation (Carr 1981).

While these discussions have been presented independently, often treating philosophy, classification, data organization, and analysis as isolated topics this independence is an artifact of the arguments and the framework within which they were developed. In reality, these four components associated with the investigation of large, complex data sets are interdependent dimensions or levels of the analytical process. For analysis to be successful the decisions made with regard to any one level and the strategies which reflect these decisions, must be compatible with the decisions and strategies made at each of the other three levels. Simply, the analytical process is one which demands cohesion producing integration and consistency. As the size of the data set increases and as the number of potential permutations between data items expands there is a corresponding increase in the need for data management and organization to facilitate both integration and analysis.

This paper is designed to present such an integrated approach to the analysis of bioarcheological data. Because of their size and the number of variables which must be investigated, the effective examination of a bioarcheological data set places a premium on both integration and organization. The magnitude and breadth of a bioarcheological data set present both numerous avenues for interpretative analysis and significant data management problems which must be overcome before the analytical potential of these data sets can be fully realized. While the data set recovered during the investigations at Cedar Grove suggests a number of productive research domains and hypotheses (see Chapter 9), a successful strategy for analysis must be developed if these hypotheses are to be satisfactorily addressed.

Successful analysis is predicated upon efficient and flexible methods for organizing our observations in a manner which insures that the potential for rapid access to information is preserved. In bioarcheological research, where a data set is comprised of multiple variables measured along numerous dimensions (see below), the potential for examining a data set from a number of different perspectives must be maintained. This condition effectively requires that the analyst has the capacity to examine any or all of the

existing data relationships or permutations within a data set. Such a paradigmatic framework for the analysis of large data sets, similar to the one recovered at Cedar Grove, demands that some form of information management strategy be applied during the investigation, in conjunction with an automated aid to analysis.

The use of computerized data-base management for both preliminary data organization and subsequent analysis is presented here as a preferable alternative to the manual organization and manipulation of data. In this context it is both the theory and method of data-base management which is applicable to the problems presented by the large data sets which are characteristic of bioarcheology. During the course of this discussion a number of concepts will be reviewed. These concepts pertain to: (1) the elements and advantages of a data-base approach, (2) the nature and composition of bioarcheological data, and (3) the nature of analysis in general and bioarcheological analysis in particular.

Following this review a provisional structure for a data-base to be applied to the organization and analysis of the data recovered from Cedar Grove will be presented. Because the development of a comprehensive data-base suitable for analysis is an energy intensive enterprise the data-base proposed here is generalized. As such it is designed to be structurally compatible with the regional problem orientation of Arkansas bioarcheology (Rose et al. 1982).

The ability to successfully capture relationships between data items, and preserve them within the structure of a data-base satisfies the need for organization as a prerequisite to analysis. However, a demonstration of the analytical capability of the data-base is still required. This section presents a survey of the analytical capacity of the proposed data-base. The analytical strength of the data-base designed for application to the Cedar Grove mortuary population will be evaluated here on the basis of its ability to facilitate the types of comparative and specialized analyses which are often performed in osteological and bioarcheological research (Buikstra 1976b; Corruccini 1974; Droessler 1981).

In the concluding section a summary of the system requirements needed to implement the proposed data-base management system will be presented. Because of the speed and versatility associated with currently available microcomputer hardware and software, a microcomputer based system is suggested. Microcomputer data-base systems of this type have been previously developed and applied to problems of data management and preliminary analysis in archeology (Farley 1982). Because of the potential to establish communications with larger mainframe computers for the purpose of executing more complex forms of multivariate analysis these microcomputer based systems are felt to be superior, offering both the user friendly operating environment of the microcomputer and the analytical strength of the mainframe.

Data Banks and Data Bases

Systems for the computerized storage of information have been variously referred to as data-bases, data banks, and management information systems (Mittman and Borman 1975; Chenhall 1975; Kelly 1970). It is often felt that these terms may be freely interchanged and are essentially synonymous (Gaines 1981). However, they each have specific implications which relate to the type of system being described and the degree to which that system has been designed to perform specific, pre-defined applications.

Martin (1977:686-690) identifies data banks as the most general of the three, being simply a collection of compatible data relevant to a specific set of problems. These are distinguished from management information systems in which the data are stored without any anticipation of the potential applications, thus resulting in spontaneous use of the data. Data-bases are seen as a collection of inter-related data stored together with controlled redundancy to serve one or more applications. In this case, the data are stored in such a way as to be independent of the computer programs which operate upon them.

While the latter construct certainly is the more cumbersome of the three, it incorporates the concepts of multiple, pre-defined applications and data-program independence. These factors are considered to be essential if automated storage and retrieval of information is to be a realistic and cost effective enterprise. Following this definition, a data-base system has the capacity to address a number of problems, and may be applied to multiple collections of information or data-bases sharing a common physical configuration or record structure. It is therefore data-bases and data-base management systems which will be considered during this discussion.

INTRODUCTION TO DATA-BASE MANAGEMENT SYSTEMS

Data-base management systems are a product of the computer age, designed to facilitate the organization and preservation of large bodies of data in a framework suitable for diverse user access and applications. Emphasizing integration between research problems and projected applications, they seek to maximize the number of uses a given body of information may serve, while minimizing the redundancy often associated with data documentation. Their use is based on the premise that it is more efficient to construct a single body of data with the capacity to address multiple questions, than it is to create multiple data sets, each tailored to a single specific need.

The construction of a data-base requires (1) extensive consideration of the potential questions which may be asked of the data (developing the problem domain), (2) the identification of variables required to address these problems (modeling data relationships), (3) conventions for data documentation (data standardization), and (4) a consideration of the manner in which variables will be associated with one another and stored on the computer (physical data organization).

The construction of a data-base system requires the consideration of two essentially discreet processes: the development of the data-base, and the

creation of a series of computer programs which operate on the information within that data-base in a manner responsive to an original set of problems. This segregation of processes permits the data-base developer to focus his attention, initially, on creating an optimal level of integration within the data, while deferring any consideration of program design to a subsequent stage of development. This condition, known as data independence (Martin 1977), results in a data-base system with the greatest breadth, or range of application. The activity associated with the completion of the data-base is data input, and that associated with the completion of the data-base system is data output. Data input and data output, or "I/O" as they are commonly referred to, are the most visible aspects of any data-base management system, and they are the primary functional components in the eyes of most users.

In this paper the concern is with those processes of data-base construction which precede the actual development of computer programs designed to respond to osteological or bioarcheological research questions. Specifically, the current objective is to delineate those elements of a data-base which combine to increase the flexibility and accuracy with which relationships between data items can be identified and preserved, and manipulated during subsequent analysis.

Ideally, when constructing a data-base, all attributes would be measured over all phenomena pertinent to any given set of research questions. If this were a realistic endeavor successful data base management would simply require extensive consideration of variables and the subsequent measurement of those variables identified. However, the identification and documentation of a potentially infinite number of variables is in no way a realistic expectation, and therefore the problem becomes one of implementing a series of cost-benefit decisions with regard to the information which will be included in the data base.

This limitation makes it imperative that the selection of data categories and variables be made on the basis of their ability to contribute to the entire set of problems being addressed. This stage of data base development requires: (1) the identification of essential, non-negotiable data categories; and (2) the elimination of variables which measure the same phenomena or closely related phenomena. This latter process, identified by Martin (1977) as the reduction of data redundancy, is accomplished only through extensive preliminary consideration of the components of the problem domain and the qualities of the variables which are required to address it.

The bioarcheological research program at Arkansas provides a well developed foundation from which to complete this stage of data-base construction. Oriented towards resolving a series of regional research questions (Rose et al. 1982), this program has continually refined the set of potential variables and data categories which need to be considered when conducting bioarcheological investigations. As a result of this previous research, both the data structure and the essential data categories needed to address regional research questions are firmly established. With the exception of eliminating some minor redundancy in the use of management data categories (e.g., burial number, accession number) the present format for recording and documenting data relationships will provide an adequate base from which to design a comprehensive data-base for the analysis of Cedar Grove.

THE STRUCTURE OF BIOARCHEOLOGICAL DATA

Units of Analysis and Dimensionality

Data-base management systems used as either management information mechanisms with a strictly organizational emphasis (Kelly 1970), or as mediums designed to enhance the analytical process (Limp and Parker 1983), are most appropriately applied to research situations which are characterized by large data sets measuring multiple variables across numerous dimensions. These data sets, and the measurements which comprise them should be amenable to some form of standardization which allows observations to be recorded in a consistent fashion. However, to be most effective these systems should also demonstrate a capacity for application to a broad range of problems thus simulating generalized systems for both management and analysis.

Osteological and bioarcheological data are most often derived from the data-base identified by Saxe (1970) and Brown (1971) as the mortuary complex. This data base, which measures a broad range of both biological and socio-cultural variables, satisfies the requirement of multi-dimensionality outlined above. Additionally, the biological component which consists of osteometric measurements and observations taken on skeletal material recovered during excavation, provides the set of standardized observations needed to establish a cost-effective data-base suitable for application to problems of analysis (cf Droessler 1981, Rose and Marks 1983). Because of the already standardized nature of the observations and anatomical measurements made on the dental, cranial, and post-cranial elements of the skeletal population, the biological dimension of the bioarcheological data set provides a suitable nucleus around which to construct an analytical data-base for bioarcheological applications.

The use of dimensions, as a heuristic device to represent the composition of data sets comprised of information relevant to the mortuary complex, has been effectively utilized in previous discussions (cf Saxe 1970; Brown 1971). This convention provides structure and clarity to discussions of dimensional data which are restricted by the linear nature of a written presentation. Additionally, a framework of this type is highly compatible with the integrated file format used in data-base applications, and as such provides a convenient conceptual aid for the present discussion.

Operating on the premise that the site is the principle unit of analysis, three primary dimensions must be considered when developing a bioarcheological data-base: (1) the osteological or biological dimension, (2) the archeological dimension, and (3) the bioarcheological dimension. From an analytical perspective both the biological and the archeological dimensions constitute valid units of investigation when considered independently. The data contained within each of these dimensions provide a cohesive body of information which may be productively exploited. However, in conjunction with the growing emphasis on a multidisciplinary approach, or a holistic format for investigating prehistory (Kay 1980, Wood and McMillan 1976), the need to integrate these dimensions has been recognized (Rose and Marks 1983). The result of this integration is the final component to be considered here, the bioarcheological dimension of the archeological site.

The archeological dimension, its structure, and its potential to contribute to the solution of research problems when preserved in a data-base

management framework have been discussed in recent reviews, and will not be subjected to an in depth discussion here. The interested reader is referred to Parker, Limp and Farley (1984) for further treatment of this matter.

The two principle dimensions which remain are differentiated from one another on the basis of their breadth, or the range of problems which they have the capacity to address. The osteological dimension is the more restricted of the two and is oriented towards defining the biological profile of the population being investigated. As such, it is used to derive demographic and paleopathological descriptions which provide the basis for general assessments of the population being investigated. Analysis of the osteological dimension is therefore descriptive, rather than interpretive, in its orientation.

The bioarcheological dimension, as presented above, is a by-product representing the integration of archeological and biological data. The integration of these two dimensions is used to develop an explanatory framework measuring the correlation between biology and culture. In this case the cultural, environmental, and biological processes responsible for the composition of both the archeological and osteological dimensions of a site are investigated as inter-dependent, causally related elements of a single system. The integration of these two dimensions makes the bioarcheological component analytically more powerful for investigations of the total system than either dimension used as a separate entity. The bioarcheological dimension is interpretative rather than descriptive in its emphasis, and provides the basis from which archeologically derived hypotheses may be tested using skeletal data while suggesting alternative hypotheses which may be subsequently investigated using independent archeological data (Rose and Marks 1983). The interactive nature of this relationship between biological and archeological data is consistent with the structure of the scientific process as presented by Carr (1981; 1984).

Within this framework the principle dimensions of a bioarcheological data-set are most effectively represented as discreet but interdependent units composed of diverse variables in which multiple data associations are measured and recorded on a number of different scales. This need for both data independence and data integration is most easily satisfied by applying the principles of data organization and data-base construction developed by Martin (1977), in association with sound osteological and archeological approaches to research.

In addition to the three primary dimensions which must be preserved within the structure of a bioarcheological data-base a multitude of subsidiary dimensions of analysis must be considered to insure a comprehensive analytical framework for data preservation. The functions' relationships between these dimensions is most effectively represented in a hierarchical structure (Figure V-1), where the first three levels constitute a perfect paradigm as defined by Saxe (1970). In this case, each superordinate dimension gives rise to two similar subordinate dimensions.

In the example presented in Figure V-1 the site is the primary analytical unit (level 1). This unit is then subdivided into the principle dimensions (archeological, biological, and bioarcheological), which together provide the integrated data-base required to respond to contemporary research problems

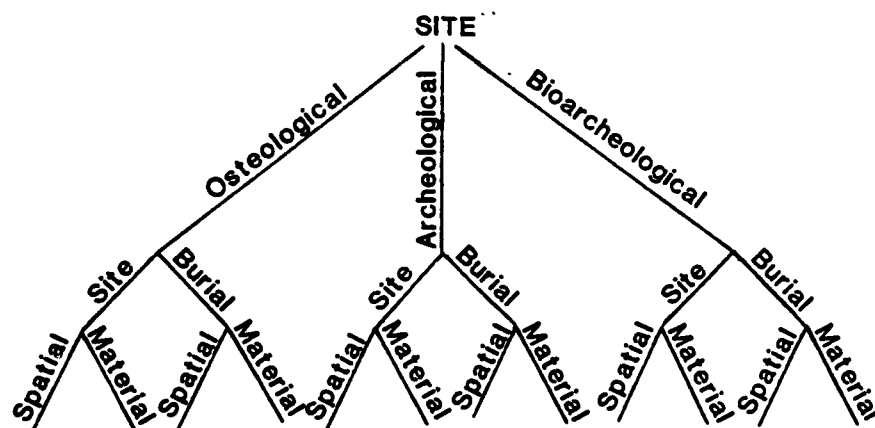


Figure 1. Dimensional nature of bioarcheological investigation.

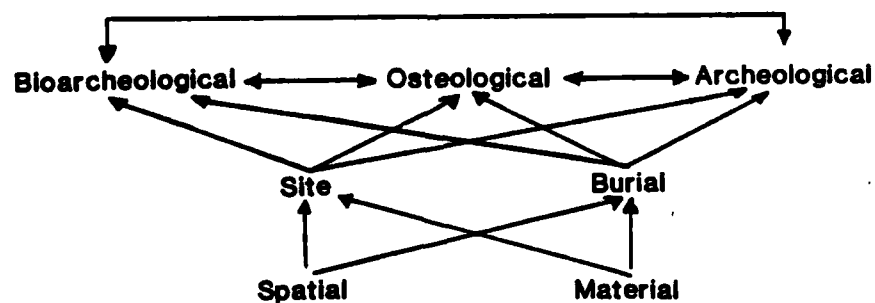


Figure 2. Analytical permutations between the dimensions of a bioarcheological data-base and to primary units of analysis.

(Figure V-1, level 2). Each of these dimensions in turn may be investigated using the individual burial or the site as the primary unit of analysis (Figure V-1, level 3), each of which is characterized by both a spatial (provenience) and a material (artifactual or skeletal) dimension (Figure V-1, level 4). In the former case, operating with individual burials as the analytical unit, a fine-grained analysis designed to identify and explore the range of variation within the population might be envisioned. This is equivalent to the attribute analysis of Hodson (1982) and Whallon (1982), which results in structural profiles of the population. In the latter instance, using the site as the primary analytical unit, a more abstract or comparative framework is established with the capacity to aid in the development of generalizations concerning the population at large. Such a coarse-grained approach to analysis can be correlated with methods of object clustering discussed by Spaulding (1982). The emphasis in this case is on the delineation of gross similarities and general patterns within the population, rather than on the identification of subtle trends and anomalies.

The important issue here is that both of these approaches represent legitimate and necessary areas of inquiry designed to contribute to the solution of specific sets of research problems, which require that the data be investigated from polar perspectives. The first of these, the macro perspective, assumes a divisive, or top-down approach to analysis, and is applied to problems of general comparison. The micro perspective, on the other hand, is a bottom-up, or agglomerative approach to analysis which is most effectively used to obtain the type of precise data required for specialized forms of analysis.

To preserve our potential to investigate all elements of bioarcheological data sets in this fashion obtaining both a macro and a micro perspective of the data, requires that an alternative to standard manual methods of data documentation and preservation be developed. For analytical purposes any relevant attributes or variables may be measured along any of these dimensions in Figure V-1, either as independent units, or integrated with any other attribute or variable to form logical subsets of the population. The complex nature of these inter-dimensional relationships (Figure V-2) precludes effective manipulation and analysis of large data sets manually, and is a primary justification for developing an automated system to maintain these diverse data associations and the data relationships between attributes and variables which they imply.

Applying the Principles of Data-Base Management to Bioarcheological Data, A relational approach

The primary problem confronting the designer of a bioarcheological data-base centers around the successful resolution of the complex data associations by which the data structure is characterized, into a data-base structure which insures the accurate preservation of these data relationships in a computer compatible configuration. Martin (1977) has demonstrated that hierarchical and paradigmatic data associations similar to those which exist between dimensions of bioarcheological import (see Figures V-1 and V-2), can be satisfactorily reduced to the two dimensional matrix type files of a relational data-base without significant loss of information. This process of reduction involves the use of redundant key identifiers, or indexing

variables which are created to maintain parallel data relationships between files. This process is conducted in conjunction with the application of principles of normalization (Codd 1972), which are applied to insure that complex data relationships can be maintained in the two dimensional files of the relational data-base. A more extensive review of this process is beyond the scope of the present discussion, but may be obtained from Martin (1977:202-246, cf also Farley 1983 for a discussion of this process in relation to archeological data).

The hallmark of a relational data-base is embodied in its organizational capacity. As an organizational device its primary function is to capture the paradigmatic and hierarchical associations which exist naturally between the dimensions, variables, and attributes of bioarcheological interest, and to preserve these associations in a framework that permits data to be examined and accessed at multiple levels of precision. For example, if the development of a bioarcheological data-base is to be successful, we must preserve the potential to conduct an examination of all post-cranial skeletal elements by burial (the dimensional level), while simultaneously preserving our capacity to assess the association of archeological data with osteological information (the interdimensional level).

Through examining the simplified schematic presented in Table V-1, the resolution of the paradigmatic dimensional associations of Figure V-1, and the data associations they imply, into the flat files of the relational data-base can be observed. In this case a master file has been created to function in an organizational capacity, preserving the redundant general provenience information which would normally be recorded for each spatial component of each dimension. The management data category (Burial Number) functions as an indexing key designed to maintain data relationships between parallel files, thus permitting the spatial data to be re-associated with both archeological and osteological data during analysis and inventory.

The primary osteological dimension and its constituent derivative dimensions now comprise the files of the osteological data-base. The archeological dimension has been similarly reduced and preserved as the archeological data-base, which contains three files for preserving data associated with the dimensions identified by Rose and Santeford (Chapter 5). Each of the files contains the indexing key (Burial Number), the significant variables by which that dimension is measured, and the observations recorded during the examination of the population under consideration. Because of the matrix structure (observation by variable), and the indexing key which may re-associate these data with either a particular burial or with a general provenience unit within the site, the potential to investigate a bioarcheological data set at both the macro and micro levels is maintained.

For example, four avenues of investigation and several variations operative at the interfile and intrafile level are readily apparent. The relational structure of the data base allows the master file to be used in association with any or all of the files which comprise the osteological and archeological data-bases to conduct:

- (1) an examination of the distribution of select variables within burials

Table 1. File structure for the bioarcheological data-base.

Data-Base	Files	Maximum Variable to Record Ratio Per Burial
Demographic	Demographic base file (1)	24:1
Osteological	Cranial non-metrics (2)	32:1
	Post cranial non-metrics (3)	18:1
	Dental base file (4)	25:1:32
	Dental pathologies*	
	Caries distribution*	
	Cranial Metrics (5)	16:1
	Post cranial metrics and inventory/pathology (6)	31:1:60+
Archeological	Mortuary component (7)	18:1
	Personal goods (8)	18:1
	Miscellaneous prehistoric and organic (9)	18:1

*These files are generated internally.

- (2) a reconstruction of the composition of a particular burial at both the intrafile level (e.g., examining the range of variation in skeletal pathologies for a given burial), and the interfile level (e.g., examining the range of both skeletal pathologies and dental pathologies in a comparative framework to determine correlations)
- (3) an examination of the distribution of a particular variable across space
- (4) an examination of the distribution of multiple variables across space while investigating the data set for covariation at both the intrafile level and interfile level.

Because of the characteristics associated with a relational approach to data management two primary benefits are derived during the investigation and analysis of large and/or complexly structured data sets. First, the speed with which known or suspected relationships between data items and variables can be evaluated is greatly increased. Second, because of the increased speed with which these preliminary assessments of data set composition may be completed the investigation of unsuspected relationships between data items can be undertaken. An examination of this latter type, attempting to uncover previously unidentified correlates is equivalent to the multi-dimensional pattern searching techniques commonly employed in both osteology and archeology (principal component analysis, factor analysis, and multidimensional scaling, etc.) and consists of an investigation of the potential permutations between data items which can logically exist within the data set. However, due to the structure of relational files this process is truncated, and what actually occurs is an inventory of those data relationships which are present within the data set. In this way the inventorying process is one of data reduction or data summarization during which much of the redundancy associated with traditional pattern searching applications is alleviated. The capacity of relational data-bases to augment these and other traditional forms of bioarcheological analysis will be more fully explored in a discussion of the analytical potential of the data-base proposed for application to the Cedar Grove data set.

A DATA-BASE FOR APPLICATION TO THE CEDAR GROVE HISTORIC CEMETERY, PROVISIONAL FILE STRUCTURE

The construction of a data-base system with the capacity to serve as both a management device and as an analytical aid during the investigation of the material recovered from the Cedar Grove Historic Cemetery requires formalized methods for documenting the diverse data associations which are inherent to bioarcheological research. The objective, at this time, is to establish the type of analytical framework which permits information from both the osteological and archeological dimensions of a site to be accessed at the multiple levels (see above) needed to create an integrated bioarcheological data-base.

The organizational problems which might be anticipated in an exercise of this scope are mitigated, to some extent, by two factors. First, the multiple measurements and observations taken on human skeletal material,

which together comprise the extensive osteological data-base, have been previously formalized in a series of data forms used for documenting osteological data at the University of Arkansas Osteology Laboratory. These forms, while exhibiting a certain amount of redundancy in the observations recorded (e.g., Burial Number and catalog number appear on most forms), provide a convenient baseline for stratifying the osteological dimension of an archeological site. The file structures and the relationships between files discussed below follow the general format for data documentation and segregation of information previously established here at Arkansas, thus emphasizing the general compatibility of osteological data with data-base applications.

The second factor which helps to facilitate the initial organization of data is associated with the archeological dimension of the bioarcheological data-base. Two alternative avenues for handling archeological data are available to the bioarcheologist who wishes to conduct research within a data-base management framework.

The first of these is particularistic and will be employed for the analysis of the Cedar Grove data set. In this case, a specialized archeological data-base will be created to process the unique data associated with this historic Black cemetery. The Cedar Grove occupation is characterized by a limited material assemblage primarily associated with the mortuary component, representing a restricted temporal span of 37 years (Chapter 5), and as such is most effectively investigated within the fine-grained analytical structure of a specialized data-base.

A second strategy for the organization and analysis of the archeological dimension is available for use by bioarcheologists in Arkansas who are confronted with more typical data sets representing less well defined occupations exhibiting a greater temporal extent. The DELOS system (Limp and Parker 1983) is a generalized archeological data-base management system designed to preserve the spatial and material dimensions of an archeological deposit in a framework which facilitates both management and analysis. It is presently applied to most archeological material recovered by the Arkansas Archeological Survey.

Integrating the DELOS system with the proposed file structure for the osteological dimension of a bioarcheological data-base requires only that the indexing key used in the osteological data-base conform to the FSN-LSN-ASN format used in the DELOS system (cf Limp and Parker 1983). Through preserving our potential to integrate the osteological data-base with the existing DELOS system, biological data can be easily re-associated with a generalized archeological data set to promote comprehensive multidisciplinary analysis of archeological artifacts, features, and specialized samples extracted from the archeological deposit, in association with the biological evidence recovered. In this way an interpretive format for bioarcheological research is established.

Three separate data-bases are proposed to meet the management and analytical requirements presented by bioarcheological investigations as they are currently undertaken here in Arkansas. Within these three data-bases nine separate files are required to insure both data independence and the potential for multi-level investigations (Table V-1).

Demographic Data-Base: File 1

This data-base is composed of a single demographic base file which preserves the generalized information required to construct a basic profile of any individual burial (Table V-2). Additionally, this file serves management needs by providing a repository for the specialized data categories needed to monitor collections during analysis. Because of the one to one record to burial ratio, this file provides an efficient mechanism for maintaining this type of management data which may need to be updated frequently. The information within this file will serve as a primary inventory device designed to monitor the skeletal collections recovered from within the state of Arkansas.

The data categories preserved within the demographic data-base (Table V-2) are pivotal, providing the integrated axis around which much of bioarcheological research revolves. For example, in the results of the preliminary analysis conducted on the Cedar Grove mortuary population (Chapter 6), each of the primary areas of interest (Mortuary Practices, Demography, Paleopathology, and Genetic Affiliation) require that data categories from this file be used either independently or integrated with data categories from other files to complete the analysis.

The analysis of mortuary practices (Chapter 6) requires that the archeological sample be integrated with biological information and stratified, at various times, by: age, sex, age and sex, and the relative spatial location of the burial. For inter-site comparisons or when the deposit is vertically stratified the data categories for site number, burial number, cultural period and depth below datum would also be required to conduct a comprehensive analysis.

The investigation of pathological and genetic data also requires that variables within the demographic data-base be integrated with data categories from other files, which measure specific biological variables. Again, the primary dimensions along which the analysis will be conducted are drawn from the demographic data-base. The preliminary analysis (Chapter 6) indicates that further analysis of the paleopathological lesion complexes require the sample population from Cedar Grove to be stratified by age, sex, age and sex, and often by relative spatial location as well. The ability to stratify the sample spatially while maintaining the capacity to manipulate the principle demographic variables (age, sex) allows us to investigate potentially significant clusters of individuals. In these cases spatial correlation may be a function of relative social position, family grouping, period of interment, period or cause of death, or other intangible factors whose delineation requires the simultaneous consideration of multiple variables.

Additionally, this data-base preserves all the significant data observations needed to construct a demographic profile of the sample population. In Chapter 6 the following statistics are computed: life expectancy, age distribution curves and probability of dying curves, while defining age and sexual characteristics of Cedar Grove mortuary population. While these types of data can be computed manually, the process is time consuming and may become unmanageable with an increase in sample size increases or when a comparative framework for an analysis of multiple archeological sites is used.

Table 2. Demographic data-base: base file variables.

Variable	Variable Code	Variable	Variable Code
Site Number	SN	Artifacts recovered	Artifacts
Burial Number	BN	DELOS encoded	DELOS
Field Serial Number*	FSN	Specimen removed	Specimen
Laboratory Serial Number*	LSN	Site name	Site
Analytical Serial Number*	ASN	Recovery date	RecDt
Age	AGE	Processing date (last date of processing)	ProcDt
Sex	SEX	Recorder	Recorder
Cultural period	CP	Photographs	Photo
Grid coordinate N/S	Grid N/S	Photo catalog numbers	Photo #
Grid coordinate E/W	Grid E/W	Caries	Caries
Unit Datum**	UD	Pathologies	Pathologies
Depth below datum	DBD	Trauma	Trauma

*Data category only utilized if archeological data is DELOS encoded.

**Data category designates the unit corner (ie. NW) which will be used to fix spatial coordinates of burial.

In any case, the preservation of the demographic parameters of the population within a data-base management framework will provide both an increase in the efficiency with which these types of analyses can be conducted and an increase in the breadth and efficiency with which the archeological and biological dimensions of the Cedar Grove data set can be stratified by the significant demographic attributes of the mortuary population.

Osteological Data-Base

The osteological data-base comprises the core of the data-base management system proposed here. Consisting of five permanent files, and having the capacity to generate two additional files for the analysis of dental pathologies and caries (Table V-1), this data-base is designed to document the critical data relationships needed to investigate the biological dimension of the archeological site. As noted above, a great deal of the data standardization and segregation of information required to construct a successful data-base has been previously accomplished during the development of the data recording procedures currently used to document osteological information at the University of Arkansas. This factor is reflected in the interfile structure of Table V-1, which is to a large extent consistent with the format for data documentation presently employed to record osteological data for manual management and analysis.

File 2: Cranial Non-metrics

The current format for recording cranial non-metrics (Table V-3) consists of 32 osteological data categories and five management variables which have been adapted from a similar format developed by Buikstra (1976a). The five management data categories are common to most of the forms for data documentation currently used in osteological analysis and as such constitute an unwarranted source of redundancy. Under the format proposed here these five variables would be recorded only once, in the base file of the demographic data-base (see Table V-2 above), and are replaced in all remaining files by a single indexing key which will facilitate the re-association of this information with file specific data as it is needed for management or analysis.

Each of the non-metric variant data categories are scored on an ordinal scale which indicates their relative degree of expression. This scale ranges from 1-8, with an entry 999 indicating that a particular variant is unobservable. Because many of the files within the osteological data-base are measured in a similar fashion, using an ordinal scale of measurement, or nominal level presence/absence data, the need to distinguish unobservable characteristics from those which are actually absent is nearly universal. In response to this need a standardized designation for those attributes which are actually unobservable was arrived at, using the designation 999 in all instances in which a characteristic is unobservable.

Of the 32 non-metric data categories present all but seven may be sided according to their anatomical location. These multi-state variables which may be either unobservable, left, right, or both left and right require some special treatment in order to make this file compatible with the data-base

Table 3. Cranial non-metric variant variables.

Site: _____	Burial No. _____	Cat. No. _____	
Recorder: _____	Date: _____		
<u>Trait</u>	<u>Right</u>	<u>Left</u>	<u>Medial</u>
Epipteric Bone	_____	_____	
Asterionic Bone	_____	_____	
Parietal Notch Bone	_____	_____	
Os Lambdoid Suture	_____	_____	
Os Coronal Suture	_____	_____	
Os japonium	_____	_____	
Infra-orbital Suture	_____	_____	
Parietal Notch	_____	_____	
Supra-orbital Notch	_____	_____	
Supra-orbital foramina	_____	_____	
Accessory Supra-orbital foramina	_____	_____	
Multiple Mental Foramina	_____	_____	
Mylo-hyoid Arch	_____	_____	
Accessory Infra-orbital foramina	_____	_____	
Tympanic Dihiscence	_____	_____	
Auditory Exostoses	_____	_____	
Divided Hypoglossal Canal	_____	_____	
Post-Condylar Canal not Patent	_____	_____	
Foramen Ovale incomplete	_____	_____	
Foramen spinosum open to F. lacerum	_____	_____	
Multiple Zygomatico-facial foramina	_____	_____	
Pterygo-alar spurs	_____	_____	
Pterygo-spinous spurs	_____	_____	
Metopic Suture open			_____
Bregmatic Bone			_____
Inca Bone			_____
Apical Bone			_____
Os sagittal Suture			_____
Superior Sagittal Sulcus turns right			_____
Mandibular Torus	_____	_____	
Palatine Torus			_____

software upon which the system is to be developed. Because this software, the Dbase II data-base package, has an upper threshold of 32 data categories per record these multi-state variables will be preserved as a single character string for each data category. For example, if both the left and right epeteric bones from a given burial are present, with a value of 1 and 2 respectively, this data would be encoded as: R2-L1 under the category epeteric.

This format provides an efficient use of space while preserving our potential for abstracting the observed value for any given data category, by side, during analysis.

The remaining seven data categories of the cranial non-metric file represent observations which occur along the medial anatomical plane. The data values for these categories are discreet, being recorded as either present (with an associated degree of expression), or absent. The variable to record ratio per burial for the cranial non-metric variants is 32:1.

File 3 - Post Cranial Non-metrics

The post cranial non-metric variants (Table V-4) consists of nine multi-state data categories, each of which may be sided in accordance with their relative anatomical position. The observations for these data categories are scored on the same ordinal scale, measuring the relative degree of expression, as the cranial non-metrics discussed above. The anticipated record format for this file consists of 18 observations per burial, with a record to burial ratio of 1:1. As was the case with the demographic base file this low record to burial ratio is viewed as a mechanism which increases both the efficiency with which data can be stored, and the effectiveness with which it can be accessed for manipulation during analysis.

File 4 - Dentition Base File

Because the analysis of dentition is such an integral aspect of the bioarcheological research conducted at the University of Arkansas (cf Rose and Marks 1983), the success or failure of any osteological data-base will be determined, to a large extent, on the basis of its ability to satisfy the analytical needs of dental anthropologists. A complete set of dentition (32 teeth) represents an analytical universe which may be investigated at multiple levels (population, individual, individual tooth) along a number of dimensions (permanent-deciduous, alveolar resorbtion, wear; and number, type and location of caries, etc., Table V-5). In this way it represents a complex set of dimensional data associations which may potentially need to be examined, and must therefore be preserved within the structure of the data-base.

The dental data categories recorded for analysis (Table V-5) consist of: (1) a series of discreet data observations measured along a nominal scale (e.g., presence/absence of caries), (2) ordinal scale measurements of the degree to which a particular condition is expressed (e.g., alveolar resorbtion, calculus deposit), and (3) ratio level observations measuring

Table 4. Post cranial non-metric variant variables.

	Right	Left
Atlas: Lateral Bridging	_____	_____
Atlas: Posterior Bridging	_____	_____
C3: Accessory Foramina	_____	_____
C4: Accessory Foramina	_____	_____
C5: Accessory Foramina	_____	_____
C6: Accessory Foramina	_____	_____
C7: Accessory Foramina	_____	_____
Humerus: Septal Aperture	_____	_____
L5: Spondylolysis	_____	_____

Table 5. Bioarcheological dental base file variables.

Variables	Measurement Scale
Mandible	Nominal
Maxillary	Nominal
Permanent tooth	Nominal
Deciduous tooth	Nominal
Erupted tooth	Nominal
Alveolar resorbtion	Ordinal
Calculus deposit	Ordinal
Caries	Nominal
Abcess	Ordinal
Attrition	Ordinal
Caries frequency	Ratio

the absolute frequency of a given attribute state (caries observed by type). The range of observations taken on components of the dental dimension of the osteological data-base is presented in Table V-6.

The proposed structure for this file requires that a single record be input for each individual tooth, thereby establishing a maximum record to burial ratio of 32:1. The record structure for this file will permit the type of diversified, multi-level analysis which is characteristic of dental research in bioarcheology (cf Rose and Marks 1983). Within this framework peripheral, special purpose data files could be internally generated by the computer for the analysis of general dental pathologies and/or for an investigation of the type, frequency, and distribution of dental caries. In keeping with the emphasis on multi-level investigations the analysis of data within these files could be conducted at either the micro level of individual burials or at a more general comparative level using the population as the primary unit of analysis.

Using the dental data, recorded under this format and preserved within the data-base structure, will allow a number of avenues of investigation to be pursued. By integrating the information recorded on dentition with the demographic and spatial data preserved within the demographic base file a series of descriptive statistics, histograms, cross tabs, correlation matrices, and cross plots can be generated and used to identify data associations along a number of dimensions.

For instance, operating at the macro level of investigation the dental data set may be merged with the demographic base file through an operation identified by Martin (1977) as JOIN. Initially each file will be sorted by the index key (Burial Number). The JOIN process then uses the redundant indexing keys which identify individual burials, as the indexing label during a serial comparison of records. During this comparison, if the indexing key or record labels are equivalent the computer will JOIN the information from the two records to form a single integrated body of information. A JOIN process of this type may be performed using either select data categories from each original record or as a mechanism to integrate all of the information from each original file (Table V-7).

With the completion of the JOIN process an "artificial" data set (D1) has been created internally, within the data-base system. This file may now be used to generate inventory listing on the microcomputer or transferred to the mainframe computer to be used in conjunction with statistical packages such as SAS (Statistical Analysis System) to provide statistical profiles or graphic representations of the population. Analysis of this sort may be conducted along any of the demographic or spatial dimensions in a search for dependency or causal relationships within the dental population.

For example, if the working hypothesis is that an increase in caries will be observed in association with an overall decrease in dental attrition or wear, a negative correlation is assumed to exist between caries frequency and wear. To investigate this hypothesis using the general population as the primary unit of analysis the data set is initially sorted by the variable WEAR. This causes a new data set to be created (D2) and organized in ascending rank order by the data value for the variable WEAR. In this case a wear score of 10 would proceed a score of 15. A second data set is created

Table 6. Key for Dental record codes.

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KEY FOR DENTAL DATA FORMS

-(Unobservable (use for any category))

1. Age
 - P - Permanent
 - D - Deciduous

2. Presence/Absence and State of Development
(two-digit code, e.g., 1A - tooth present in socket, completely formed)
 - 1 - Present in socket
 - 2 - Absent anteroposteriorly, with evidence of socket resorption
 - 3 - Absent postmortem
 - 4 - Apertures of tooth
 - 5 - Tooth present but no observable socket
 - A - Completely formed
 - B - Root incomplete
 - C - Crown only formed

3. Eruption
 - 1 - Completely erupted
 - 2 - Partially erupted
 - 3 - Unerupted

4. Alveolar Resorption
 - 1 - None
 - 2 - Slight: 1 to 3 mm
 - 3 - Moderate: 3 to 5 mm
 - 4 - Severe: more than 5 mm.

5. Calculus Deposit
 - 1 - None
 - 2 - Slight: discrete areas
 - 3 - Moderate: coalesced areas
 - 4 - Heavy: three-dimensional deposits

6. Caries Presence and Location
 - 1 - None
 - 2 - Pit and fissure.
 - 3 - Interproximal
 - 4 - Cervical
 - 5 - Smooth surface (B - buccal surface; LIS - lingual surface; LAS - labial surface)
 - 6 - Root

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7. Abscess Presence and Size
 - 1 - None
 - 2 - Small: 1 to 3 mm diameter
 - 3 - Medium: 3 to 5 mm diameter
 - 4 - Large: larger than 5 mm diameter

9. Occlusal Wear

(after Murphy, T., Gradients of dentine exposure in human molar tooth attrition, *American Journal of Physical Anthropology* 17:179-186)

Stage 0 - The molar is fully erupted but no dentine is exposed.
The enamel may display some wear.

- 1 - Dentine is exposed on one cusp only.
- 2 - Dentine is exposed on two cusps.
- 3 - Dentine is exposed on three cusps.
- 4 - Dentine is exposed on all cusps.
- 5 - Two dentine areas are coalesced, leaving two discrete areas of exposure.
- 6 - Three dentine areas are coalesced, leaving only one discrete area of exposure.
- 7 - All areas are coalesced, leaving no discrete areas on the cusps but a narrow peninsula or island of enamel in the central portion of the occlusal surface.
- 8 - Dentine is exposed over the entire occlusal surface, save for a narrow rim of enamel partially or completely surrounding the surface.
- 9 - All enamel is completely worn away, and the superior surface of the tooth root now functions as the occlusal surface.

10. Bucco-lingual diameter (in mm)
11. Mesio-distal diameter (in mm)
12. Crown height from enamel-cementum border (in mm)

Table 7. Integrating information from separate files: the JOIN operation using select data categories from the demographic base file (A) and dental base file (B), presorted on the Index Key Burial Number.

(A)

Burial Number	Age	Sex	N/S	E/W
10	25-30	M	N20	E30
14	30-35	F	N120	E40
21	55	F	N300	E100

(B)

Burial Number	Mandible/ Maxilla	Tooth Number	Permanent/ Deciduous	Caries	Attrition/ Wear
10	Mandible	29	P	4	5
14	Mandible	29	P	2	15
21	Mandible	29	P	1	25

(C)

Merged data set for analysis of dentition along demographic dimensions of the population (D_1).

Burial Number	Age	Sex	N/S	E/W	Mandible/ Maxilla	Tooth Number	Permanent/ Deciduous	Caries	Attrition/ Wear
10	25-30	M	N20	E30	Mandible	29	P	4	5
14	30-35	F	N120	E40	Mandible	29	P	2	15
21	55	F	N300	E100	Mandible	29	P	1	25

(D3) in a similar manner using the caries frequency value as the primary sort variable. A general indication of the relationship between caries and wear can now be obtained by generating an inventory listing of either data set (D2 or D3) and comparing the relative values of these data categories for each individual burial. Inventory listings of this sort may be obtained easily using a microcomputer and a high speed printer. Listings obtained in this manner provide a convenient mechanism for evaluating potentially significant data relationships prior to engaging the mainframe computer for more powerful, but more time consuming forms of analysis.

Assuming that a negative correlation is indicated between caries and wear in the inventory listing, more comprehensive forms of data screening may be desired to determine the nature and strength of this relationship. In this case the original integrated data set (D1) may be transferred to the mainframe using a communications protocol package similar to MCALL (Pugh 1980). At this point individual frequency histograms may be generated, using SAS, for both caries and wear, and subsequently used to compare the relationship between these data categories visually. In a similar fashion descriptive statistics, cross tabs, cross plots and a correlation matrix may be constructed also to provide a numerical assessment of the relationship.

The example above provides an illustration of the mechanics involved in record and file manipulation for analysis within a relational data-base. However, for bioarcheological analysis it is over simplified, disregarding the natural demographic strata within a mortuary population and the potentially significant spatial dimension which may need to be incorporated into analysis if an adequate explanation of the observed range of variation within the population is to be derived. A more exhaustive presentation of the potential avenues of investigation for the Cedar Grove data set (D1), are presented in Table V-8. In each of these cases the mechanics of the analysis are similar to or the same as those presented in the example above.

Additionally, this file (D1) can be integrated with any of the remaining files within the proposed data-base (skeletal inventory and pathology, mortuary components, etc.) to explore further any suspected data relationships. In any case, the mechanics of this integration and the subsequent data manipulations are consistent with those presented above, following the general principles prescribed for relational manipulation by Martin (1977).

File 5 - Skeletal Metrics, Cranial

The cranial metric data file consists of a series of standard anatomical measurements recorded on 15 cranial variables (Table V-9). The data observations in this file are recorded on a ratio scale of measurement, and as such satisfy the data requirements of all forms of mathematical and statistical operations (Davis 1973). A single record will be input for each burial, making the variable to record ratio per burial equivalent to 16:1. Again, by employing the sorting or indexing facilities of the Dbase II data-base software package in association with the standard relational manipulations of records and files discussed above the information within this file can be associated with data from any of the eight other files

Table 8. Data screening using the dental data file and demographic and spatial information from the demographic data base.

Technique	Dimensions of Stratification
Inventory Listing	Mortuary population
a. caries (total)	Age
b. caries (by type and location)	Sex
c. permanent teeth	Age and sex
d. deciduous teeth	Spatial location
e. alveolar resorption	Individual teeth
f. calculus deposit	
g. abcess	
h. attrition	
Descriptive Statistics, Cross tabs, and Histograms	Mortuary population
a. caries (total)	Age
b. caries (by type and location)	Sex
c. permanent teeth	Age and sex
d. deciduous teeth	Spatial location
e. alveolar resorbtion	Individual teeth
f. calculus deposit	
g. abcess	
h. attrition	
Correlation Matrices and Crossplots	Age
a. caries (total)	Sex
b. caries (by type and location)	Age and sex
c. permanent teeth	Spatial location
d. deciduous teeth	Individual teeth
e. alveolar resorbtion	Caries by type and location
f. calculus deposit	Permanent teeth
g. abcess	Deciduous teeth
h. attrition	Alveolar resorbtion
	Calculus deposit
	Abscess
	Attrition

Table 9. Variable list for the cranial metric data file.

Cranium	
1. Max. length	_____
2. Max. breadth	_____
3. Max. height	_____
4. Porion-Bregma ht.	_____
5. Min. frontal brd.	_____
6. Upper facial ht.	_____
7. Bizygomatic brd.	_____
8. Orbital ht.	_____
9. Orbital brd.	_____
10. Maxillo-alveolar lth	_____
11. Maxillo-alveolar brd	_____
12. Bicondylar brd.	_____
13. Mandibular lth.	_____
14. Ascending ramus ht.	_____
15. Symphyseal ht.	_____
16. Burial number	_____

within the data-base system during analysis. An expanded review of this type of analysis is presented in the following discussion of file 6.

File 6 - Osteometric Data and Paleopathologies

It is the structure of this file which most effectively demonstrates the efficiency and flexibility which can result from data-base management applications to bioarcheological analysis. Under the existing format for data documentation, information on pathological observations, postcranial osteometric measurements, and the data needed to conduct a general inventory of the skeletal material in association with any given burial are recorded on five separate forms. The management and research problems associated with accessing this dispersed data to execute the type of standard comparative analysis which has been discussed in the previous pages are substantial. When dealing with large samples or when attempting to develop comparative statements using multiple samples from different sites the progress of analysis is impeded by the sheer logistics of the task.

However, when operating within the data-base management framework advocated here the range of data necessary to investigate the postcranial metric structure of the population, its pathological composition, or to generate a simple inventory listing of the material recovered can be preserved within a single file. This file has three primary components, each associated with a particular aspect of bioarcheological analysis as it is performed at the University of Arkansas: post cranial metrics, pathological data, and general inventory information.

To alleviate the redundancy associated with preserving multiple observations on a particular bone (e.g., presence/absence, condition, osteometric measurements, presence/absence and type of pathology), in separate locations, this file consolidates the pertinent information, preserving all data relevant to a bone as single record or logical unit of information (Tables V-10, V-11). The information within this file can then be used to identify differential rates of preservation, providing the basis for comparative studies and to conduct: general inventories, multivariate analysis of post cranial osteometric data, and/or an investigation of relative health status leading to the diagnosis of specific disease rates within the population or its demographic subsets.

Post Cranial Metric Data

The post cranial metric data set (Table V-10) consists of ratio scale measurements made on post cranial material. These observations which are anatomically sided, multistate variables represent 48 potential measurements which may be taken on any given individual. However, these observations exhibit extensive data redundancy with measurements such as maximum height, maximum breadth and maximum length being recorded repeatedly for individual bones. Through using a series of data categories which together express the total range of these measurements in association with the bone by bone inventory format of this file, the original 48 measurements are reduced to 11 common data categories. Under this format the use of any measurement data category is contingent upon the bone condition score (complete (C), partial

Table 10. Postcranial osteometric observation recorded in data categories 7-17 of records in the osteometric/pathology file (File 6).

Scapula	Right	Left
Max. length	_____	_____
Max. breadth	_____	_____
Clavicle		
Max. length	_____	_____
Circum. Midshaft	_____	_____
Humerus		
Max. length	_____	_____
Min. diam. head	_____	_____
Circum. midshaft	_____	_____
Radius		
Max. length	_____	_____
Ulna		
Max. length	_____	_____
Phys. length	_____	_____
Innominate		
Max. height	_____	_____
Max. breadth	_____	_____
Ischial lth.	_____	_____
Pubis lth.	_____	_____
Femur*		
Max. lth.	_____	_____
Phys. lth	_____	_____
Max. diam. head	_____	_____
Circum. midshaft	_____	_____
Subtro. A-P diam.	_____	_____
Subtro. M-L diam.	_____	_____
Tibia		
Max. lth.	_____	_____
A-P diam.	_____	_____
M-L diam.	_____	_____
Fibula		
Max. length	_____	_____
Sacrum**		
Max. ant. ht.	_____	_____
Max. ant. brd.	_____	_____

* Subtro. S-P/M-L diameter is not distinguished from A-P/M-L diameter as recorded under Tibia in the recording format (Figure 10), but should be understood if bone name=Femur

**Anterior height/breadth are not distinguished from maximum height/breadth in recording format (Figure 10), but should be understood if bone name=Sacrum

Table 11. Data-base pathology scoring key (modified from Powell).

Lesion Score

- P-Present
- A-Absent
- 999-not observable

Lesion Class

- F-Flourishing
- R-Remodled
- H-Healed

Lesion Categories

- A. Resorptive Lesions
 - 1. Superficial Lesion (cortex)
 - 2. Deeper Lesion (subcortical)
 - 3. Granular Lesion
 - 4. Stellate Lesion
 - 5. Suppurative Lesion
 - 6. Porotic Hyperostosis (no hypertrophy)
 - 7. Porotic Hyperostosis (hypertrophy)
 - 8. Cribra Orbitalia (no apposition of new bone)
 - 9. Cribra Orbitalia (new bone present)
 - 10. Other
- B. Osteolytic/Proliferative Lesions
 - 1. Cortex Pitted or Striated
 - 2. Apposition of new bone with no destruction of underlying cortex
 - 3. Destruction of cortex, sub-periosteal apposition formation of sequestrae and bone necrosis
 - 4. Destruction of cortex, sub-periosteal apposition with no necrosis
 - 5. Other
- C. Degenerative Joint Diseases

Trauma

- 1. Fracture
- 2. Pseudo arthritis
- 3. Dislocation
- 4. Projectile damage to bone
- 5. Other

Lesion Size

Lesion Involvement

- 1. Isolated
- 2. Moderate
- 3. Extensive

Lesion Location

Post Cranial

- 01=epiphysis
- 02=metaphysis
- 03=diaphysis
- 04=joint surface
- 05=other

Vertebrae

- 11=craio-caudal surface
- 12=non-articular surface
- 13=transverse process
- 14=spinous process
- 15=other

Pelvis

- 21=illium internal
- 22=illium external
- 23=ischium/pubis internal
- 24=ischium/pubis external
- 25=other

Ribs

- 31=head/tubercule region
- 32=pleural surface
- 33=external surface

(P), fragmentary (F), absent (A)) and the bone name. For example, a complete scapula would only require that maximum length and maximum breadth be entered. A complete radius would only require that the value for maximum length be entered. However, a complete femur would require observations on five variables in addition to maximum length. Following this format a single record will be input for each bone from every burial providing both management and osteometric data. In this way the structure of this file reduces the amount of effort required to encode data while maintaining the flexible access to data needed for analysis.

Using the recording format of this file in conjunction with a modified version of the pathological key developed by Powell for this project (Table V-11), a comprehensive survey of lesions and trauma as they are spatially distributed across the skeleton can also be conducted. Using select data categories from the demographic base file in association with the data categories 6 and 18-31 of the osteometric/pathology file both the differential diagnosis of disease (Buikstra 1976b) and the comparison of pathology patterns within the population are realistic objectives.

The pathology specific data categories within this file (Table V-12) include observations on: lesion and trauma type (Categories 18, 22, 26), size or degree of involvement (Categories 21, 23), specific location on the bone (Categories 20, 24, 27) and an estimate of lesion or trauma state (flourishing, remodeled or healed, Categories 19, 25, 28). Because there may be multiple observations (per bone) for any given trauma or lesion type which must be differentiated during analysis, multiple records for a particular bone may need to be input. For instance, if the left tibia exhibited three different resorptive lesions at different locations, pathological data would need to be recorded on three separate records.

Using the record continuation data category (32) serves to minimize the number of redundant data categories which need to be encoded. In the example above only the data categories Burial Number, Bone Name and Anatomical Side would need to be encoded on the two additional records needed to express the lesion distribution on the left tibia. While this format may inflate the number of records input to this file it insures the type of fine-grained data discrimination necessary to conduct comprehensive pathological analysis.

The metric data compiled for both cranial and post cranial elements is amenable to most any type of statistical technique by virtue of its ratio scale level of measurement. These data are well suited to multivariate types of analysis such as multiple regression and discriminant function analysis (Droessler 1981). Because these techniques require extensive computational time much of the multivariate analysis of metric data will be conducted on the mainframe computer. However, much of the preliminary analysis or data screening which precedes such multivariate applications may be executed or initiated on the microcomputer.

Carr (1981) has noted that the reliability of any results obtained through multivariate forms of analysis are dependent on the degree to which the underlying structure of the data is consistent with the assumptions of the statistical technique to be employed. To ascertain the degree of correlation between the assumptions of a particular technique and a specific data set requires that the data structure of the data set be defined through

Table 12. Record forms card data categories for bioarcheological data base file 6.

1 Burial Name	2 Bone Name	3 Anatomical Side	4 Burial Section	5 Bone Condition Score	6 Lesion Score
7 Maximum Length	8 Maximum Breadth	9 Maximum Height	10 Circumference Midshaft	11 Maximum Diameter Headshaft	12 Minimum Diameter Headshaft
13 Physial Length	14 Ischial Length	15 Pubis Length	16 A-P Diameter	17 M-L Diameter	18 Resorbitive Lesions
19 Lesion Class	20 Lesion Location	21 Lesion Size	22 Osteolytic/ Proliferative Lesion	23 Involvement	24 Lesion Location
25 Lesion Class	26 Trauma	27 Trauma Location	28 Trauma Class	29 Degenerative Joint Disease	30 D-5 Location
31 D-5 Class	32 Record Continuum				

descriptive statistics, histograms, correlation analysis and cross plots. This process, identified as data screening, is the first level of a multi-step program for analysis which is designed to insure that a high level of cohesion is established between data set structure and multivariate analytical technique.

The format for the analysis of the osteometric data during data screening is consistent with that described for the dentition. Initially, these data sets must be reassociated with the variables preserved in the demographic file through a JOIN process, thus reconstructing the natural demographic and spatial structure of the Cedar Grove mortuary population. Again, the principle data categories drawn from the demographic file are : age, sex, grid coordinate N/S, and grid coordinate E/W. A JOIN performed on these select elements of the demographic base file and either the cranial or post cranial metric files would result in a two dimensional relational matrix similar to that presented in Table V-7, illustrating the JOIN process using the dental base file.

Data screening would proceed in essentially the same manner as was described for the analysis of dentition. It would involve multiple inventory listings of the merged data set, generated on the microcomputer and stratified along the pertinent demographic and spatial dimensions. Descriptive statistics, cross tabs, histograms, correlation analysis, and cross plots would then be generated on the mainframe using the merged data set and similar dimensions for stratifying the sample.

Once the merged data set has been transferred to the mainframe and its structural characteristics have been delineated through data screening, investigation may continue using the more robust statistical tests of packages such as BMDP (Biomedical Computer Programs - Series P, Brown 1977). This system may be accessed directly from SAS giving the data-base user increased flexibility during analysis.

For example, if sexual differential in stature is suspected, and it is further anticipated that this differentiation will be compounded by age (Chapter 6), the following analytical framework might be hypothesized. Select metric attributes of the Cedar Grove mortuary population are inventoried repeatedly along the dimensions of age, sex, and age and sex to determine if the expected correlations are indicated. In the event that the results are positive, the merged data set is transferred to the mainframe using the MCALL procedure (Pugh 1981) and data screening continues using the statistical and graphic capabilities of SAS. If the results at this time indicate further analysis is warranted, the SAS data set is placed into the BMDP system through the SAS interface PROC BMDP. At this time the biologically oriented multivariate statistical routines of the BMDP package may be used to evaluate the degree to which stature is dependent on age and/or sex, or to assess the accuracy with which the original demographic structure of the population was determined.

Skeletal Inventory/Pathology

Determining the nature, extent, and patterned distribution of pathological lesions (e.g., differential diagnosis) to ascertain the health

status of an individual or the general adaptive efficiency of population is a primary emphasis in contemporary bioarcheological research (Armelegos 1969, Lallo and Rose 1979). Pathological data contributing to such general evaluations may be examined at multiple levels and along numerous dimensions, in a manner similar to that described for dental data.

For the analysis of pathological data, the bone by bone inventory format advocated here serves two principle functions. First, it helps to mitigate the dimensional nature of the complex data associations which together define the pathological profile of a population (Chapter 6). By establishing such a fine-grained recording format (bone by bone) for pathologies we can be sure that the data associations present are accurately preserved within the relational structure of the data-base. Second, by implementing this format, which maximizes our ability to investigate the data set from multiple perspectives, the unnecessary limitation of analytical avenues of investigation is avoided.

As noted above the successful interpretation of paleopathological data requires that the anatomical distribution of lesions be organized and differentiated. These lesions, which may represent multiple lesion complexes superimposed on one another throughout the life span of an individual, must be differentiated by their location on individual bones for successful differential diagnosis to take place (Buikstra 1976b). Additionally, the analysis must distinguish between healed and remodeled lesions if a determination of previous infection and an evaluation of the possible work environment of the individual can be developed (Chapter 6). In a small sample, an analysis of this type is hampered by the absence of automated data management. In a large sample indepth analysis of this type is impossible without some form of computer assisted data organization and manipulation.

For example, in the discussion of preliminary paleopathological results (Chapter 6) Rose was primarily restricted to dealing with lesion location at a gross anatomical level (e.g., lower limb, upper limb, thoracic, etc.) rather than at the more specific - location on bone level - designed to produce more precise results. Even within this framework he was able to identify general lesion complexes associated with the primary demographic components of the Cedar Grove mortuary population, suggesting plausible sources of disease insult, causes of death and potential physical activities which would have contributed to the stress observed on the skeletal material.

However, this differentiation between lesions by type and anatomical location can be more effectively conducted within the data-base management framework advocated here. Initially, the osteometric and pathology file may be used to assess the degree and type of lesion and/or trauma involvement at the micro level of analysis, on a burial by burial basis. At this time the data set is sorted, first by the data category Burial Number, and subsequently by any or all of the remaining data categories. A sort by the variable resorbtive lesion would yield an inventory listing of all bones exhibiting this trait and include the lesion site and its location by individual burials. Similar sorts using osteolytic proliferative lesion or trauma would result in similar listings. If lesion size or location were of interest the data set could be subset along these dimensions yielding similar results. Analysis of this sort defining lesion patterns on individual skeletons would be beneficial in developing the type of diagnostic key needed

to refine estimates of specific disease involvement (Chapter 6). Additionally, it would preserve the capacity to identify the range of variation for any given lesion complex, thereby reducing the potential for over estimating the number of lesion complexes evident within the population.

At a macro level of investigation a similar strategy can be employed to evaluate the frequency and patterned distribution of lesions and trauma by type across the population. For instance, if the burial by burial inventory suggested a high frequency of osteolytic proliferative lesions on the joint surfaces and transverse process of the vertebrae, this condition could be investigated at the level of the population. Using the Cedar Grove mortuary population as the primary unit of analysis the skeletal inventory and pathology data file is subset by the variable osteolytic proliferative lesion to create a subsidiary file which contains only those skeletal elements which exhibit this condition. At this point, the data set is sorted by both the variable bone name and the variable lesion location. The results of this file sort may be examined to see if they are consistent with the initially observed pattern.

Up to this point no consideration of the demographic or spatial properties of the population has been incorporated into the discussion of paleopathology. However, as Rose has shown in Chapter 6 both demographic and spatial variables must be used when operating within an interpretive framework. By conducting a JOIN which merges the principle demographic (Age, Sex) and spatial (Grid Coordinate N/S, E/W) variables with the data on skeletal inventory and pathology a framework suitable for such an investigation of the differential distributions of trauma, lesion by type, and lesion complex pattern is established. By implementing the type of analytical program delineated above for dentition and skeletal metrics, using this merged data set, the structure of the Cedar Grove mortuary population, as it is preserved in the pathological dimension, can be explored. An analysis of this type would provide the descriptive statistics, frequency diagrams, correlation matrices, and density plot contour distribution maps necessary to derive an accurate understanding of the underlying structure of the data set and its natural strata (demographic and spatial). A simple example can be used to illustrate the point.

Rose (Chapter 6) has noted a possible differential distribution of osteoarthritis by sex within the Cedar Grove population, which he has subsequently correlated with male/female work activities. Transferring the merged data set to the mainframe computer and accessing the SAS system these suspected relationships can be easily investigated. Using the PROC CHART facility within SAS a histogram can be generated to compare the relative frequency distributions of osteoarthritis by bone for both males and females. In this case the merged data set would be subset using condition statements to arrive at a data set composed only of males and females exhibiting particular degenerative joint diseases. The SAS statement: IF SEX = MALE OR SEX = FEMALE AND DEG JOIN = OSTEOPHY OR DEG JOIN = OSTEOAR; would accomplish this subsetting of the original merged data set. If the histograms for males and females indicated the suspected clustering of male osteoarthritis in the major joints and female osteoarthritis in the hands additional investigation using correlation analysis could be pursued. By adding additional parameters to the conditions statement (see above) the population could easily be stratified by age and spatial location as well as

by sex. Alternatively, the results from the pathological analysis could be integrated with any archeological data file by performing a JOIN using the indexing key Burial Number to investigate the relationship between disease rate/type and artifactual material.

Archeological Data-Base: Files 7-9

Because of the limited range of variation exhibited by the artifact assemblage recovered from Cedar Grove and because considerable effort has already been expended during the preliminary analysis of this material (Chapter 5) a specialized data-base format is suggested to manage this data. Under different circumstances a more generalized framework, similar to that employed by the DELOS system (of Limp and Parker 1983), would be advocated. Within DELOS a single record documenting individual artifacts or artifact groups would be prepared and input for each burial. This format places a premium on flexibility, maintaining multiple dimensions along which the artifact assemblage may be stratified and examined. However, because each burial from Cedar Grove is stratified along three to six horizontal dimensions and because much of the preliminary data tabulation has been previously conducted (cf Chapter 6), a DELOS type format requiring multiple records for each burial section does not appear to be a cost effective strategy.

The record and file structures to be used within the archeological data-base will reflect the dimensions and data categories identified by Santeford (Chapter 5), and will follow the tabular format he uses for data presentation. Within this framework the artifact assemblage is stratified by three primary dimensions and preserved within files containing data on: the mortuary component, personal goods, and miscellaneous prehistoric and organic remains. Under this format the artifacts from each of these three dimensions will be input using a maximum of 18 records for each burial. This maximum figure assumes that the burial being investigated is an adult which has been excavated following the sectional plan, and that artifacts associated with each of the three primary dimensions identified by Santeford have been recovered from each section.

During analysis these files will be employed to investigate data relationships at multiple levels within the Cedar Grove mortuary population. Any or all of these data files can be merged with demographic and spatial data to expand upon the analysis initiated by Rose and Santeford (Chapter 6), or integrated with data documenting particular biological characteristics of the population. In these instances the mechanics associated with the manipulation of records and files remains consistent with the procedures outlined in the previous discussion (see above).

SUMMARY AND SYSTEM REQUIREMENTS

The data-base system presented in the proceeding discussion is designed to meet both the immediate analytical needs presented by the Cedar Grove mortuary population and the general data management needs of the regional

bioarcheological community here in Arkansas. This system has been designed to exploit both currently available microcomputer technology and existing statistical systems operating on the University of Arkansas mainframe installation to maximize the effectiveness and efficiency with which research and data management can be conducted. The most desirable attributes of this system are presented below.

- 1) By placing the data directly into a data-base management framework the need for redundant data encoding and data input prior to the application of commonly used multivariate forms of analysis is eliminated.
- 2) By taking advantage of the response time and manipulative speed of the microcomputer four things are accomplished:
 - a) data input is conducted in a rapid, user friendly environment which should minimize input errors;
 - b) file maintenance, management, and data cleaning are conducted under similarly advantageous circumstances;
 - c) the ease with which standard demographic profiles, lesion complex profiles, inventory listings of skeletal material and archeological material can be produced during analysis is greatly enhanced;
 - d) the capacity to investigate data associations both within and between files using general inventories for comparative purposes is greatly increased.
- 3) By using select elements of the data set in conjunction with a communications protocol package data may be transferred to the mainframe computer to generate descriptive statistics, graphics for visual comparison, or for the purpose of executing the sophisticated biologically oriented multivariate statistics of the BMDP series.
- 4) This system, when integrated with existing data-base systems (AMASDA, DELOS) serves as a basis for constructing the comparative framework needed to investigate regional patterns which result from the interaction of numerous biological, cultural, and environmental variables.

System Requirements

Because of the rapidly expanding market and the rate of innovation in the area of microprocessor technology a generalized overview of the system requirements (hardware and software) needed to support the proposed data-base will be presented. This review presents an example optimum "Best of all possible worlds" solution to the data-base management and analytical needs presented by bioarcheological research and a more conservative "minimum

requirements" alternative. Because of the general overview nature of this section more specific data will need to be collected prior to final selection and the purchasing of equipment on which to implement the system.

The optimum system would meet both present and future research needs of bioarcheologists by exhibiting the potential for unconstrained upgrading or expansion. In this sense the original purchase might be limited to a computer with a fixed storage capacity, a monitor and a high speed printer, however, these components would be expandable to keep pace with increased user needs. For example, if the original system includes a computer with a card cage and S100 BUS the addition of peripheral memory, graphics capabilities and other peripheral units (e.g., digitizer) would be realistic objectives that would not require a total re-tooling of the system. Alternatively, to meet increasing user demands which may outstrip the capacity of a single machine, a networking or multi-tasking environment may be designed to meet the elevated work load. In a very real sense the additional cost associated with the optimal system is incurred not as a function of the superiority of the hardware being purchased, but rather as a direct result of its upgradable status.

The example minimal system requirements needed to develop the proposed data-base require a consideration of memory capacity, operation speed, and software. Hardware requirements consist of a computer with 128k RAM, with the capability to use a portion of RAM to simulate a semidisk, a monitor, a high speed dot matrix printer and an acoustic coupler and modem for communication with the mainframe. To effectively deal with the number of files and the corresponding large number of records which are anticipated a hard disk with fixed memory between 5 and 8.3 mg is suggested. The use of the hard disk, like the 64k RAM to simulate a semidisk, will increase the speed with which standard data management tasks are performed. The hard disk will increase operation speed by a factor of 4 over the more common floppy disks associated with microcomputers, while providing a fixed storage space that ranges from 5 to 20 times the capacity of a floppy. In the event that a greater storage capacity is required the hard disk can be supplemented with double density 8" floppy disks. At least one floppy would be needed for data backup and transport.

The minimum software requirements consist of an operating system, a compatible data-base software package, and a communication protocol package to facilitate the transmission of information to the mainframe. While the UNIX operating system suggested for the optimal system is likely to become the industry standard (Limp, personal communication) the CP/M system presently used by a majority of the 8 bit machines will be adequate. The Dbase II data-base software package is offered here as the most effective means of meeting the diverse applications envisioned for proposed data-base system. While Dbase does have some limiting characteristics (i.e., maximum variable per record = 32, slow sort routines) these can be mitigated either through programming or the use of peripheral units (semidisk, hard disk) to increase its speed.

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CEDAR GROVE HISTORIC CEMETRY: A STUDY IN BIO-HISTORY

7/7

(U) ARKANSAS ARCHEOLOGICAL SURVEY FAYETTEVILLE

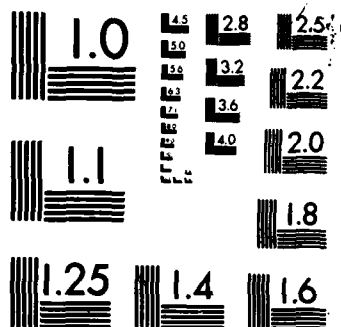
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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PEER REVIEWS

by

George J. Armelagos
Willard B. Gatewood, Jr.
Richard S. Meindl
Ted A. Rathbun
Larry D. Banks
Bennie C. Keel

Brief Response to Dr. Keel's Review
by
W. Fredrick Limp

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Rose and co-workers have provided a report which will become a model for the recovery and relocation of historic cemeteries. Working under extremely difficult time constraints, the researchers were able to extract a vast amount of information that will be useful for years to come.

A reading of the scope of services for the contract and a review of the report indicate that Rose and colleagues have satisfied the contract in exemplary fashion. The analysis of the historical, archeological, and biological material indicate a concern for detail and an understanding of the broader aspects of the changes that have occurred in the adaptation of the groups in this region over time. The discussion of the place of the Cedar Grove Cemetery is very well done.

The authors are to be commended for writing their report in a clear and concise manner. I was entranced by much of the report. The authors provide an excellent example of how to proceed from excavation, recording and analysis. And they make it fascinating reading.

The researchers are aware of the most advanced research techniques and incorporated them in their research. The use of the autopsy technique for the recovery of samples which will be used for future histological and chemical analysis is noteworthy. Rose and co-workers shall extract valuable information from bone turnover rates and trace mineral analysis.

The use of the demography and pathology data to aid in understanding the adaptation of the Cedar Grove population is excellent. While the sample size is very small, and it is difficult to generalize to all post-emancipation populations, the information will be an important source for future researchers. The information gained from these skeletal remains will provide a "window" to the understanding of past adaptations.

There are a few suggestions that can be made to improve the final draft. There could be better integration of the descriptive aspects of pathology found in the descriptive section of the burials and in the analytical chapters. For example, thoracic lesions are described by a general term (resorptive lesions) on page 210 and referred to Schmorl's nodes on page 287. It would have been useful for the term Schmorl's nodes to have been in both places.

I have some disagreement with the authors' emphasis on the need for specific diagnosis (on page 248). They argue for the importance of specific diagnosis; the analysis of non-specific lesions (such as periostitis and porotic hyperostosis) can provide important information on the disease process. Indeed, the authors do in fact analyze much of their material in terms of the non-specific lesions.

The comparison of Cedar Grove with the Carib Indians from Dominica seems strained. Why not use information from southern United States samples for this comparison?

The demographic analysis has some elements of circularity. The authors are attempting to determine if it is a "normal" population and to use deviations in demographic indicators of stress. The resolution of this dilemma deserves further discussion.

The preliminary discussion of genetic affiliation is hampered by the fragmentary nature of the material. While I am sure that the final analysis will resolve some of the questions raised by researchers, they should be cautious in some of their preliminary statements. For example, the authors suggest that the nasal gutter in Burial 47 suggests African ancestry and that extreme shoveling of incisors (in the same individual) might argue for American Indian mixture. While the occurrence of shoveling appears frequently in the American Indian, the trait also occurs in other racial groups. The analysis these traits obviously require is population analysis. The researcher's use of multivariate techniques in the preliminary analysis indicates that they are well aware of this need.

There are a few interpretations that could be re-evaluated. The nodules found on the endocranial surface of Burial 43 could be indicative of hyperostosis frontalis interna. I would like to see a more detailed discussion of the Hutchinson's incisor found in Burial 83. The proposed microscopic analysis will resolve the question of interpretation.

In summary, Dr. Rose and the Arkansas Archeological Survey are to be commended for their efforts. They have provided a first rate preliminary analysis of the recovery and relocation of an historic cemetery. There is no question that their techniques and methods will become the benchmark by which other studies are measured.

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I have read the Draft Report of the "Cedar Grove Historic Cemetery" with much interest and great profit. As an historian who has done research both in the history of Afro-Americans in the late nineteenth and early twentieth centuries and in the history of the state of Arkansas, I consider this an extraordinarily significant project because of the information and insight that it provides about black life in the rural south, or more particularly the southwest, from the era of Slavery into the twentieth century. The findings of a biological and anthropological nature supplement, complement, and, to a substantial degree, go beyond what historians have ascertained about black life--diet, diseases, genetics, etc.--from written records. But projects of this sort, combined with those of a more purely historical nature, will surely result in a vastly more comprehensive and meaningful view of black life than now exists.

The "Historical Background" by Beverly Watkins strikes me as remarkably comprehensive, based upon meticulous research in both primary and secondary sources. The sections devoted to the "historic documentation of the Cedar Grove locality," the community, the cemetery and the people are rich in detail and provide valuable insights for studying a particular cemetery. Watkins has utilized all pertinent sources as far as I can determine.

No less impressive is Chapter Seven, "Cedar Grove and Black American History," by Jerome C. Rose. Clearly, Rose has mastered the essential historical literature relating to Afro-Americans and is sensitive to the major areas of disagreement among various historians regarding the quality of slave life--adequacy of diet, health and mortality rates. The works of Savitt and Kiple and King, which are among the latest and best, are used with great effectiveness. It is unclear whether Rose has, or intended to, utilize historical journal articles, and while I do not presume to know much about specific articles relating to Afro-American diet, disease, health, mortality rates, etc., I would suggest that likely sources for such articles include the Journal of Southern History, the Journal of Social History, and the Journal of Black Studies.

Given the impressive range of research and methodologies used in this project, it is difficult to suggest sources that have not been cited. It may be that the Arkansas History Commission in Little Rock, or even perhaps the regional archives in Old Washington, Arkansas, might possess plantation

records, diaries or journals from Lafayette County or contiguous areas that would provide some data pertinent to diet and what Rose refers to on page 309 as "social unrest among the members of the Cedar Grove community at the turn of the century." Of course, a close reading of local newspapers and court records, if any are extant for the period, might provide clues about this issue as well as others.

This is, in my opinion, a tremendously important project with far-reaching implications. In Chapter Nine, "Proposed Research Directions ... " Rose and Santeford indicate under three headings--mortuary behavior, historic demography, and osteology--the particular areas to be addressed in future analysis and research. Speaking for historians interested in the Afro-American experience, I can say without qualification that such analysis and research, in addition to findings embodied in this project, will correct some misconceptions, clear up facets of rural black life which at best remain vague, and substantially enrich our understanding of the black experience in general.

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The following comments will be limited to the methodology portions of the report as they apply to skeletal recovery and analysis.

The excavation, analysis, and reburial of the Cedar Grove Historic Cemetery constitute an important project from the standpoint of archaeology, human biology, and the study of post-civil war America. Black American history can only be enriched by the careful recovery of a historic cemetery and its eventual comparison to contemporary vital registration. Arkansas was not one of the ten original registration states in this country, and it is expected that rural vital registers suffered from sizable underenumeration well into the twentieth century (see for example Higgs 1973). Surely the extent of the error with respect to certain sex-age classes has never been estimated. Of course, such bias in registration must be especially true of the black population. In fact, the demographic history of Afro-Americans between the period of reconstruction and World War I is largely unknown--a sad state of affairs for those who wish to reconstruct the social and economic histories of a unique population. Therefore, should the Cedar Grove Project prove at all useful in confirming or improving the accuracy of this portion of the local censuses, or the Baptist Church records themselves, the vital records of areas such as Lafayette County can become primary data in the reconstruction of Black American demographic history (for a clever method of the use of two spotty sources of vital registration to come up with a third one of superior accuracy see Vinovskis 1972).

For this reason a skeletal biologist/anthropologist of the caliber of J. C. Rose is an essential aspect of both the recovery and analysis portions of such a project. Demographic reconstruction by age and sex of a biological population requires a thorough application of the modern methods of forensic anthropology. While the aging of the subadults of the unmarked graves poses no real problem in the case of the complete burial, the accurate assignment of adult ages-at-death is problematical. The methodology section (Chapter 4) indicates that Rose and co-workers are quite aware of the limitations of traditional forensic methods, and that they endeavored to employ the latest techniques whenever possible. It will be interesting to see how accurate these methods are for that core portion of the cemetery with extant readable markers over the graveshafts. These recent studies are based upon museum cadaver collections from a limited

population (see Meindl et al. 1983). Such tests of forensic accuracy have been possible in the past; however, a survey of the literature reveals that the potential was seldom realized.

In the remains of the largely forgotten burials of Cedar Grove is recorded a rich biological history. The potential for study of growth, dimorphism, and stature, of dental and other pathology, and of bone loss and nonspecific indicators is obvious from this report. The protocol of the skeletal analyses (constricted by time and resources) and the nature of the data recovered reflect Roses's experience in the analysis of ossuary populations--an experience (and expertise) gained from work with both Old and New World archeological/mortuary sites.

I might have preferred that more time per burial be allocated to the systematic sampling of cortical and trabecular bone sites, the photographing and casting of those portions of the adult skeleton useful in determining age, and similar recording of those elements of the adult female pelvis that are of obstetrical significance. It may reflect my bias, however these are data more important than many of the other post-cranial measurements (for adults at least) and clearly superior to the time-consuming task of cranial reconstruction and mensuration. I realize that this work was stipulated in the contract, and fortunately, due to the frequency of cranial deformation and disintegration, such toil was limited to a handful of cases.

Thus, given the care exercised in the necessarily speedy reburial of these remains, this is an important and highly competent preliminary study of the physical anthropology of the descendants of Cedar Grove.

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Rose and co-workers have produced an impressive study of the human remains recovered from the Cedar Grove, Arkansas cemetery. This work has important implications in all the integrated traditional areas of science: data, methodology, and theory. The recovery of biological as well as archeological data helps to fill in a significant gap in the temporal, regional, and topical coverage relevant to historic preservation.

It is especially heartening to see a cemetery treated as an important historical resource. Since traditionally such sites are not considered for the National Register, this report should illustrate that cemetery data are extremely important above and beyond the usual categories associated with distinctive persons, design features, and association with historic events. This narrow definition of historic importance fails to recognize that human remains provide data of considerable historic importance. Not only are many segments of the population omitted from typical historical sources, but the skeletal remains provide empirical evidence directly relevant to broad historical issues in health, nutrition and social customs. The biological history of our nation has received insufficient attention to date, especially during the time spanned by the Cedar Grove cemetery. I have argued elsewhere (Rathbun 1981) that human remains should be considered an important archeological and historical resource. This study should serve as an important precedent in considerations of other cemeteries under the purview of historic preservation. Even if some of the information inferred from bioarcheological analysis is available from other sources, validity and accuracy of other records can be evaluated through comparison with the physical evidence. Finally, data from human remains serve as an important scientific resource for the development of methodologies and theory in a number of scientific fields that can have historic implications. Brooks and Brooks (in press) present another example of the range of general and particular historic questions that can be determined from historic cemetery remains.

Data Recovery

As mentioned in the introductory statements, the bioarcheological data from the Cedar Grove cemetery are not available elsewhere. Besides the intrinsic value of this information for a particular group, these data

should be valuable in documenting social trends and biological processes through comparison with other regional populations from preceding and successive historical periods.

The analysis of the mortuary goods including coffin hardware as well as the personal items included in the grave helps to document oral history, folklore, social status markers, and temporal frameworks of the community. (I found the egg inclusions in the graves interesting and applicable to my work in South Carolina). The demographic data, although not as precise as could be obtained with more time for analysis, help to confirm generalizations about the demographic history of American Black populations during this time. Many of the principles concerning demography and archeology articulated by Hassan (1979) can be extended to historical groups of this kind.

The morphological characters of the skeleton as documented by the cranial and post-cranial measurements, discrete traits of the skull and post-cranial skeleton, dental feature, and pathological conditions in this study provide an important reference standard for comparison with preceding and successive populations. The choice of attributes to be collected from the skeletal material was comprehensive considering the time constraints for examination. The measurements and discrete traits have become standards in the protocol of osteological analysis. The use of dental casts as well as the collection of autopsy specimens for subsequent study was important. Rose and co-workers have already shown the significance of dental data through their previous publications. The detailed notation of pathological lesions traditionally has not been standard. As Rose argued in the body of the report, this approach is essential for successful differential diagnosis of disease states and analysis of internal site patterns. Finally, the proposal for the computerization of the data already recovered from the skeletons is reasonable and should be of use to others of us working on similar samples.

It is unfortunate that not enough time was allocated for the restoration of damaged materials. The cranial metric data could have been expanded significantly if this had been done. This contingency should be considered in later projects and proposals. The investigators, however, cannot be faulted in this instance. Additional measurements that might have been included are nasal height and the length of the glenoid fossa of the scapula. The first measurement is of use in racial diagnosis and forensic analysis, and the latter is considered for sex diagnosis by some. A more comprehensive battery of discrete traits of the post-cranial skeleton such as that proposed by Finnegan (1978) would have maximized possibilities for later evaluations of genetic distance.

In summary, the data retrieved from the human remains of the Cedar Grove cemetery are significant, met the contract stipulations, and promise to lead to important historical and osteological findings with the subsequent analyses proposed in Chapter Nine.

Methods

The documentation of the field methods in this report is excellent. The estimation of time and the documentation of the time and effort in exhumation and processing under such adverse conditions will be invaluable for others faced with similar problems. Extensive planning and well-thought out logistics are evident. The data sheets in Appendix I and II are clear, comprehensive, and allow for accurate and precise documentation and analysis. In fact, they should serve as a model for osteological analyses of other prehistoric and historic cemeteries. As mentioned in the data review above, a few measurements and observations could be added. Under the trying field circumstances, it is amazing that so many data were collected in a systematic manner and the summary descriptive statements reflect excellent organization. The principal investigator, field supervisor, and the crew must have had remarkable stamina and dedication, indeed.

The methods of analysis and description of the osteological data are appropriate. Although the descriptions of individual graves may have been tedious to produce, such documentation allows other workers to evaluate conclusions independently and perhaps to detect other elements not initially noted. In addition, I personally make a case for individual burial descriptions on humanistic as well as scientific grounds. Anecdotally, it was through the examination of the individual descriptions and comparisons with figures that I was able to account for the absence of some of the burials in Chapter 5, e.g., Burial 26.

The methods of sex and age determination are adequate under the circumstances, but observational data on sex diagnosis could be checked by statistical techniques developed by Giles (1970). Age of adults could be evaluated by the microscopic structures of the autopsied femur specimens following the methodology of Kerley (1965). Even though fragmentation precluded extensive use of Giles and Elliot statistical evaluation for genetic affinities, the photographic record of the skulls should allow for evaluation of the morphological characters. Evaluations of the degree of curvature of the femoral shaft (Stewart 1979) would have added to the degree of confidence for "racial" diagnosis. Since the human remains have unavoidably been reburied, precise confirmation and evaluation are impossible. The degree of precision possible from later re-evaluation of the photographs seems tenuous, but may provide corroborative evaluations.

The careful notation of burial positions and the degree of disarticulation of some of the skeletons may provide significant insight into problems of prehistoric taphonomy. Rose's comments on this topic are cogent. Little is known of the processes of decomposition of buried remains. Documenting the probable events from these graves may prove important for forensic physical anthropology. Specialists in this field frequently must determine the circumstances of death and natural decomposition events must be distinguished from criminal mutilation. Information from the Cedar Grove cemetery will have direct implications in this area.

I am not qualified to comment on the methods used for the historical sections, but the range of sources seems adequate and the accounts are intelligible.

Findings

The interpretations of the Cedar Grove burials in Chapter 6 are reasonable and logically follow from the data gathered in earlier chapters. The intrasite distribution of infant graves is somewhat puzzling. Since infants usually precede parents in death, a particular area within a cemetery rather than in a family plot is plausible. The possibility of multiple deaths from an epidemic with group interment is intriguing, but the demographic structure of this small community possibly did not allow for this number of infants at any one time.

The demography and the status distribution of artifacts by age are as would be expected in a poor, rural community. Although the data have to be interpreted in relationship to the Circle of Friends burial society, researchers should remember that burial expenses are more inclusive than just the casket and that personal items might be an individual family choice and unrelated to the society.

The investigators successfully address the reservations held by many concerning the applicability of cemetery remains to demographic analysis. I do not see the sex ratio at Cedar Grove to be a particular problem. In small groups such as this, random variation is to be expected and the cultural factors of male absence coupled with female mortality during the child-bearing years and male remarriage could easily produce the ratio indicated.

Although the analysis of pathology among the Cedar Grove burials is considered preliminary, a number of important findings are indicated. The neonatal death rate does suggest population stress. Childhood mortality and specific links to known diseases must wait the differential diagnoses. Nonetheless, the presence of widespread bacterial infections, perhaps congenitally acquired, does appear linked to cultural and historic phenomena. The argument linking early death to diet through weanling diarrhea is convincing. It is unfortunate that time did not allow collecting data on timing of formation of linear enamel hypoplasias, radiographic examination of the long bones for lines of increased density, and other indicators of systemic metabolic stress.

The documentation of high stress and poor nutrition for the Cedar Grove adults as well as the physical stress might be expected in many poor, rural groups, during this time. Trauma with infection of the limbs is a frequent pattern among farmers, especially if the diet produces a low resistance. The interpretation of cranial and rib fractures as the result of interpersonal violence is not as convincing. Just as it is difficult to attribute infective lesions to a particular disease without epidemiological data, so too must analyses of trauma be tied to documentation of work patterns and accidents. Farm work with machinery and animals puts the males at a higher risk for this type of injury. This is not to deny the presence of interpersonal violence, but rather to question the basis of attributing

the trauma to a specific cause. The bullet wounds appear definitely to be the cause of death, but there is no indication of the manner of death: accident, suicide, homicide.

The findings of the genetic affinities of the Cedar Grove skeletal material and the indications of European and American Indian admixture has both historical and forensic identification implications. The distinction between morphological and social "racial" categories is an important one. Although European admixture with African slaves is generally known, the degree of gene flow between Blacks and Indians is not as widely recognized. Pollitzer (1958) attempted to evaluate the degree of affinity of contemporary local Black populations in South Carolina with general categories of American Whites, American Blacks, and West African populations, but Indian admixture was considered negligible. In my own forensic work in the state, however, morphological characters often associated with Indian groups such as shoveled incisors, accessory sutural bones, and flaring zygomatic arches frequently are noted in individuals socially recognized as Black. Subsequent genealogical information frequently confirms some Indian ancestry. Applications of the Giles and Elliot discriminate functions also frequently are similar to the results in the Cedar Grove study.

The reliability of the Giles-Elliot formulae for distinguishing between Blacks and Indians has been questioned (Birkby 1966, Gill in press), but tests with documented forensic cases (Snow et al. 1979) indicate that the technique is still a useful tool for both sex and race determinations. As Rose notes, the subsequent population analysis using other data from the skeletons may be more informative concerning population distances and the population dynamics in the area. Multivariate analysis by sex rather than as a pooled group may reveal differential hybridization.

In Chapter 7, Rose convincingly interprets the historic significance of the Cedar Grove burials for evaluations of diet, mortality, and health. The discussion of the controversy of diet and quality of life points out the erratic nature of traditional historic sources and the need for detailed archeological and physical anthropological investigations. As noted in the discussion, very little osteological information is available from any of the historic periods. In attempts to establish trends and evaluations associated with historic and cultural developments, reference samples from preceding and successive populations are necessary. Documentation of conditions during the slavery period from skeletal samples are still tentative and the sample sizes are extremely small. Although Rose frequently cites our work at the Colonial period South Carolina plantation, I hasten to point out that the slave sample was very small and the comparative materials were drawn from a number of different sites. Evaluations of the different ecological regions and regional cultural patterns do need to be evaluated separately. A review of the archeology (Singleton in preparation) and physical anthropology (Reitz, Gibbs, and Rathbun in preparation) of the Atlantic coast plantation system is in preparation. Comparisons and contrasts with the Cedar Grove materials should prove illustrative. Not only will comparisons with other rural populations through time be important, but evaluations of commonality with

urban groups may illustrate differential dynamics. Blakely and Beck (1982) and Beck (1980) provide some data comparable to the Cedar Grove study for a small sample of Atlanta Blacks from the same time period. Of particular interest would be the comparisons of trace elements in the bone and the implications for differences in diet. The femoral shaft autopsy specimens from Cedar Grove should allow this kind of analysis, as well as comparisons with the lead content of skeletal material from the Colonial period at Belleview and Cliff's plantations.

In conclusion, the study in bio-history of the Cedar Grove Historic Cemetery is a significant piece of work. Rose and co-workers are to be lauded for illustrating the importance of the human remains as an historical resource. The data will continue to be an important source for historic, demographic, morphological, dental, and medical studies. The methods used in the study can serve as a model for maximizing data recovery in salvage situations. It is unfortunate that the material could not have been examined longer. Nonetheless the findings of the study are important in our understanding of the biological and cultural status of a little known group and have implications for evaluations of historic trends on a larger scale. This report, indeed, documents the successful completion of the contracted project.

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In the Cedar Grove report (pages 4-7), Department of Interior (DOI) and Advisory Council on Historic Preservation (ACHP) policies on inclusion of historic cemeteries in the National Register of Historic Places are discussed relevant to the Cedar Grove case, and to some extent for historic cemeteries in general. There is a growing tendency among Federal and State agencies to include historic cemeteries as cultural sites in discussions of environmental impacts from civil works projects. By including cemeteries as cultural features, it would follow that "mitigation" may increasingly fall under the purview of historic properties authorities and responsibilities rather than under the traditional auspices of Relocation or Special Studies. It is one thing to consider all historic cemeteries for impact considerations as cultural resource features (as implied by DOI guidelines), but it is quite another to consider marked cemeteries as being eligible for the National Register of Historic Places with a view toward archeological excavation.

There are a number of instances where historic cemeteries and individual burials have required application of archeological methodologies in investigation ranging from location and data retrieval to reporting. For example, an unmarked historic Creek cemetery was excavated during construction of the Crosstown Expressway in Tulsa, Oklahoma, and near Great Bend, Kansas, a stream cut exposure of Walnut Creek revealed a human burial. The subsequent archeological investigation by the Kansas Historical Society resulted in providing interesting and significant supplemental data to eye witness accounts of a Kiowa massacre of ten teamsters (8 Anglos and 2 Blacks) on July 18, 1864. The graves were unmarked. In such cases, archeological approaches are logically the best method of investigative procedures to be used.

In the case of Cedar Grove, the State, National Register, and Advisory Council of Historic Preservation concurred in the decision that the cemetery component should be treated as an archeological feature rather than as a standard, non-archeological relocation effort. The process of transforming that decision into reality required the U.S. Army Corps of Engineers to solve a myriad of logistical, legal, and practical problems. The solution of these problems required the full cooperation of Red River Levee District No. 1, Cedar Grove Baptist Church, and Lafayette County Circuit Court. In most cases, archeological research institutions and organizations are simply

not equipped, nor should they be, to handle the problems associated with cemetery relocations regardless of whether or not cemeteries are on the National Register of Historic Places. The most elementary and cursory factors/problems to be addressed can be listed as:

1. Legal--State and local laws specifically protect historic cemeteries from excavation and disturbance by persons other than a coroner; state laws and local interests also control where and how individuals are reburied, the collection of samples and specimens, and disposition of grave goods.
2. Public Reaction, Christian Ethics, and Sanctity--Although reactions vary, the issue of archeological investigation of a cemetery is often emotionally charged. The archeologist's goals may not coincide with those of the next of kin or the community. Negotiation with and sensitivity to all parties concerned are imperative. Public reaction rather than archeological concerns guide a court's decision to allow deviation from normal relocation procedures.
3. Conflicts with the Mortuary Science Business--Cemetery relocation is a business, protected by law. Routine treatment of cemeteries as archeological sites could potentially arouse political attention detrimental to the historic preservation movement.
4. Health Hazards--Several diseases can be contracted unless inoculation and decontamination stations are used.
5. Professional Dispute over Acceptable Methods of Scientific Excavation, Reburial, and Reporting--Significant advances have been made in bioarcheological techniques through excavation and analysis of prehistoric cemeteries. Similar results may not be obtainable with historic cemeteries because of legal requirements governing reburial.
6. Cost Accounting--Apart from excavation and analysis costs, historic cemetery excavation may involve legal fees, location of next of kin, land purchase, coffin and grave marker purchase, etc. Should the entire cemetery relocation be paid for out of the one percent statutory limitation of federal expenditures? If so, this could seriously impair completion of archeological investigations on any number of large projects because of the ubiquitous nature of the resource.

Lengthy discourses could be written on the pros and cons of each item, but the first two categories alone contain enough problems to discourage any attempts to arbitrarily investigate all "historic" cemeteries as cultural resource features beyond the level of evaluation of written records. There is no question concerning the capability of archeological methodologies to contribute some new data from any historic period cemetery but, having had some limited experience as a cemetery relocations inspector, I do have some specific thoughts on this subject which would be too involved to discuss in this review. Based on this personal experience, however, I simply do not believe the historic preservation element is ready to take on the problems which would be associated with a move to become any more archeologically

involved with cemeteries than we are now. There is probably no other single aspect of public works projects which elicits as many highly sensitive public concerns, reactions, and variety of emotions as do cemetery relocations. This seems to be true regardless of culture, age, or condition of the cemetery. However, as in the case of Cedar Grove, policies should be flexible enough to determine appropriate treatment of cemeteries on an individual basis. One change in Corps procedures which would probably be of benefit to all concerned parties would be consideration of assigning an archeologist or physical anthropologist to work with cemetery relocations on specifically warranted projects or cemeteries. Archeologists are better trained and adept at locating unmarked graves than are most cemetery relocation contractors. Having a physical anthropologist present during cemetery relocations would certainly produce more bioarcheological data simply from observation and selected measurements, etc., than is currently done. While such operations could not practically yield the same level of data as that collected from Cedar Grove, the resulting additions to cemetery relocation reports would be of overall public benefit, and the means of obtaining the data would not be viewed by anyone as being as obtrusive as full-scale archeological investigations.

In conclusion, I would suggest continuing the current policies of DOI and the ACHP concerning inclusion of cemeteries on the National Register, and addressing the archeological approaches on an individual basis. Legal counsel should be sought before applying archeological methods of study to any historic cemetery.

Until recent years, the Corps approached the issue of cemetery removal with an inflexible set of guidelines which were based more on precedent than on strict legal requirements. I do recommend that the Corps be more open-minded in recognizing and applying alternative approaches, when warranted, to investigative studies of cemeteries. Cemeteries occur in endless variety (i.e., marked, unmarked, abandoned, buried, recorded, unrecorded, old, modern, etc.) and it is reasonable to assess the data value and potential for data recovery of each with some recognition of these individual characteristics. Using the Cedar Grove case as background, I recommend that New Orleans District develop explicit criteria for such considerations and that the resulting guidelines be distributed for Corps-wide review and consideration.

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We are pleased to be able to provide you with a review of the draft report on the Cedar Grove Historic Cemetery, prepared by the Arkansas Archeological Survey under contract DACW 29-81-0059 (P0002). We will also provide some comments on the scope of services and the mitigation plan for this project.

First, let me say that overall we were very impressed with the quality of this report and with the work done by Dr. Rose and the Survey on this project. Obviously, the work was done under rather severe time constraints, and the work plan implemented by the Survey allowed them to accomplish a considerable amount of research and to produce a product containing much useful information on this burial population.

The scope of services for change order 001 indicates, in number 2.j., that all grave goods as well as the burials themselves were to be reburied. Was it really necessary to require that the artifacts, as well as the burials themselves, be reburied? Was this a requirement of the church or a state law? We recommend that some explanation be given to avoid future questions. Given the very short time available to study the remains, it would have been desirable to retain the artifacts for additional analysis.

We note that the scope does not discuss analysis of the material and data collected and recorded by the project. Although the body of the report does contain some analytical discussions, clearly the contractor was not able to conduct a complete analysis of the data. Section 3(a) of P.L. 93-291 makes it clear that analysis of data recovered is part of the responsibility of Federal agencies in cases where agency activities may cause loss of significant data.

Although the scope does not discuss the time period within which individual burials are to be reburied, the proposed mitigation plan does. The church requested that reburial take place within 24 hours of disinterment. This is a very short period, considering the value of these data and the requirements of the scope. Additionally, it is clear from the report that although reburial occurred within a few days, it was not possible to meet the 24 hours deadline. Would it not have been possible to negotiate with the church for a somewhat longer period of time? This would have allowed the contractor to record a larger body of information, to

recheck previously recorded burials when initial analyses suggested that errors in recording had occurred, and to go back and pick up additional information that appeared important based on information from previously analyzed burials. Considering the obviously important character of these burial data, it is unfortunate that a little more time was not available.

In the mitigation plan, section 9.b contains some unfortunate wording. Rather than using the terms "superstition or fetish," some less judgmental wording such as "evidence related to folklore and beliefs" might have been used.

Neither the scope nor the mitigation plan--nor the report, for that matter--contains a reference to the authority under which this work was done.

The report itself, while overall of high quality, does need considerable editing. Our copy did not contain Figure 1-1, nor pages 53 and 54. The captions for Figures 2-5 and 2-6 are reversed. In Figure 3-1, among others, it is not clear what the small circles scattered about the map represent. Several paragraphs near the end of the summary on adolescent burials (p. 264) appear to belong in the following section, "Young Adult." In Chapter 4, Methodology, much of the discussion of who did what when is excessive. Comments such as "Dental casting presented the smallest of all efforts once Marks learned the correct proportion of materials to use" are somewhat out of place in a scientific report. Reporting that dental casting was performed by using a mixture of thus and such ingredients would have been sufficient. Many similar personalized statements should be edited out of the final report. In the same chapter, stylistic differences between sections 3 and 4, sections 1, 5, and 6 should be edited out. Chapter 8, summary and conclusions, is a somewhat disorganized discussion of a variety of topics--history of the area, field techniques, analysis of the data, and others. Some of the extensive tables in the appendices might be best presented in a microfiche format.

On page 38, it states that historic records were searched while data recovery was underway. We believe that, particularly in the case of historic resources, records searches should be completed well before data recovery begins. Only in this way can the contractor and the agency receive full benefit from the information obtained from the records search. This information should be used to guide and limit the data recovery. Much unnecessary and unproductive data recovery has been done because of a failure to obtain or use information that already exists in the documentary record. Certainly, when such a sensitive resource as historic burials are known to be present, every effort should be made in advance of construction or data recovery to locate any existing documentation of the resource. Had the 1925 map been located earlier, it would have been possible to improve planning for appropriate data recovery and analysis.

On page 44, it is stated that wire nails were manufactured after 1830. This early date applies to nails made in France--and it is quite unlikely that the inhabitants of Cedar Grove had access to French nails. Wire nails were not widely available in this country until much later. On page 46, it

is stated that Bristol slip was made between 1880 and 1900. Actually, this slip is still being manufactured.

The chapter containing the burial data starts with Burial 10. We do understand that the first nine burials were excavated previously, and that some problems exist concerning the exact burial count. However, we recommend that the first nine burials be listed and discussed in this chapter, in the same format as the subsequent burials insofar as is feasible, for the benefit of future researchers.

Additionally, it is clear that, in general, the estimates of cemetery size, total number of burials, yearly mortality, and related factors are all built on supposition and were not established by the research program. Although certainly the authors do not attempt to disguise this fact, it would be useful to state this specifically as part of the summary information. Indeed, it would make the existing data more useful if some of these uncertainties could be cleared up. For example, the limits of the site as well as additional information of burial numbers and distributions might be readily obtained using some non-intrusive exploratory techniques such as the Corps used at the site of Deer Creek on Kay Reservoir in Oklahoma.

As noted above, additional analyses would have been desirable. It appears that the ability of the contractor to undertake these analyses was limited by the scope, by the time available, and we imagine, by the budget for the project. We recommend that the Corps consider whether it has fulfilled its obligations under P.L. 93-291. Chapter 9 of the report provides some suggestions about what additional analyses might be undertaken. Studies specifically directed to a more complete understanding of the Cedar Grove resource could be considered the agency's responsibility. One of the most obvious examples of this type of study is an examination of historic catalogs to obtain information on the dates of use of the casket hardware recovered, in order to specify more precisely the date of interment. Many of the osteological analyses suggested also would be appropriately funded by the Corps. On the other hand, the more general studies directed at understanding areal or regional factors would be more appropriately funded by the State Preservation Office or an outside funding source such as NSF.

Regarding your request for comments on the treatment of historic cemeteries as cultural resources, we would like to reiterate the position of the National Register. Cemeteries are a property type not generally considered eligible, but many individual cemeteries have been listed on the Register. When it can be expected that individual cemeteries will produce important information not available elsewhere, they may be eligible. Such was the case of the Cedar Grove cemetery. Clearly, much of the information on this historic black population produced by research on this cemetery would not have been available elsewhere. Many examples are presented in the research report. We agree with the Register's determination. Clearly, this is a property type which must be considered carefully and on an individual basis when questions of eligibility arise.

BRIEF RESPONSE TO DR. KEEL'S PEER REVIEW

The issues raised by Dr. Keel's review require a brief response. Dr. Keel raises a number of points pertinent to timing and limitations placed on the data recovery program, specifically the reburial of artifacts and the 24 hour reburial requirement. One can only agree with Dr. Keel that under ideal circumstances more time and fewer limitations would be scientifically desirable. It must be recognized, however, that the agreed upon plan was the result of a successful compromise involving a variety of community groups, institutions, and state and federal agencies. In addition, all work was conducted within the limitation of state law pertinent to the treatment of cemeteries (which requires reburial of objects as well as skeletons). As is often the case, even successful compromises may not be totally ideal from any individual perspective. Furthermore, it must be emphasized that these agreements were reached under the press of emergency conditions which had the potential of destroying the resource itself as well as the partially completed construction project.

Dr. Keel also questions whether the Corps of Engineers completed its responsibility for mitigation. Clearly, there remain further analyses which must be done, and clearly further financial support is needed for these analyses. What is of consequence is whether the mitigation plan and the work conducted was sufficient to meet the requirements of PL 93-291. We refer Dr. Keel to the determination of the President's Advisory Council on Historic Preservation and the Arkansas State Archeologist who reviewed and approved the mitigation plan, as well as the comments of the other peer reviewers pertinent to the results of the project reported to date. Finally, it should be noted that the State Archeologist has reviewed and accepted the report as satisfactorily meeting the Scope of Work and the agreed upon mitigation plan.

Though it is not the first project of its type, certainly the mitigation of the Cedar Grove cemetery is a pioneering project from the view of bioanthropology, archeology, and history. Similarly, it is also a pioneering project from the perspective of the agency and its relationships and responsibilities to the local community. This is particularly true where there are differing regulations pertinent to cemetery relocation and to cultural resource treatment. As new ground in any area is broken, there are always lessons to be learned. As a result, Dr. Keel's, and all the peer reviewer's, contributions in pointing out areas for future improvement is particularly valuable and their assistance is much appreciated.

W. Fredrick Limp
Coordinator

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